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ANATOMY

PAPER-I :

GENERAL ANATOMY, GENERAL EMBRYOLOGY, GENETICS, GENERAL HISTOLOGY, UPPER LIMB, HEAD & NECK, NEUROANATOMY, SYSTEMIC EMBRYOLOGY related to UPPER LIMB, HEAD & NECK, NEUROANATOMY
SYSTEMIC HISTOLOGY related to UPPER LIMB, HEAD & NECK, NEUROANATOMY
GENERAL QUESTIONS

PAPER-II :

THORAX, ABDOMEN & PELVIS, LOWER LIMB, SYSTEMIC EMBRYOLOGY related to THORAX, ABDOMEN & PELVIS, LOWER LIMB
SYSTEMIC HISTOLOGY related to THORAX, ABDOMEN & PELVIS, LOWER LIMB
GENERAL QUESTIONS

* The topics to different paper are generally evaluated under those sections. However, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

QUESTION PAPER PATTERN

Total duration- 3 hrs			
Question pattern	No of questions	Max mark	Total marks
Multiple choice questions(MCQ)	20	1 mark each	20
Essay questions	2	10 marks each	20
Short essay questions	6	6 marks each	36
Short answers	6	4 marks each	24
Total marks			100 marks

Pattern for multiple choice questions

Sl.no	Type of questions	No of MCQ	Marks
1)	Single response type	5	5x1=5 marks
2)	Multiple response type	5	5x1=5 marks
3)	Assertion reason type	5	5x1=5 marks
4)	Clinical scenario based MCQs	1 scenario with 5 questions	5x1=5 marks

ANATOMY PAPER-I

QUESTIONS		YEAR
GENERAL ANATOMY		
BASIC TISSUES		
SHORT ESSAYS		
1	Describe the structure and function of skin with its appendages.	May 23
SHORT NOTES		
2	Connective tissue fibres	Feb 14
3	Compound glands	Aug 11
MCQs		
Old questions (1 mark)		
4	Types of cells seen in thymus.	May 23
BONES & JOINTS		
LONG ESSAYS		
1	Classify joints. Give the structure of synovial joint with an example.	May 23
SHORT ESSAYS		
2	Describe the structure of synovial joints. Classify synovial joints with examples.	Jan 24
3	Classify cartilage with suitable examples. Describe the structure of elastic cartilage.	Feb 22
SHORT NOTES		
4	Classify synovial joints with an example for each	Jul 24
5	Types of epiphysis	Jan 24
6	Sesamoid bone	Jul 23
7	Periosteum	Feb 23
8	Pivot joint	Feb 22
9	Blood supply of long bone.	Feb 22, Aug 15
10	Epiphyseal plate	Nov 20
11	Fibrous joints	Feb 15, Feb 16, Jul 17
12	Epiphysis	Feb 16
13	Osteon	Jan 18
14	Cells of bone tissues	Feb 17
15	Anterior fontanelle	Aug 18
MCQs		
single response type questions		
16	Which of the following is an example of a cartilaginous joint a) Humeroulnar joint b) Intervertebral disc joint c) Cranial sutural joint d) Tibiotalar joint	Jul 24
multiple response type questions		
17	Which of the following statement/s is /are true about sesamoid bones 1) They are bony nodules found in tendons or joint capsules	Oct 24

- 2) They ossify before birth
 3) They have no periosteum
 4) They help to minimize friction
 a) 1,2,3 b) 1, 3, 4 c) 1,2,4 d) 1,2

Old questions (1 mark)

18	Two sites of occurrence of elastic cartilage	Nov 23
19	Name any two types of epiphysis	May 23
20	Example of atavistic epiphysis	Feb 23
21	Horizontal long bone.	May 22
22	Two sesamoid bones	Aug 21
23	Any two types of bone cells	Aug 21
24	Two examples of pivot joint	March 21

MUSCLES

SHORT NOTES

1	Sarcomere	Jul 17
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CARDIOVASCULAR SYSTEM

SHORT ESSAYS

1	Describe the various types and structure-function correlation of blood vessels.	May 22
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NERVOUS SYSTEM

SHORT NOTES

1	Neuroglia	Mar 21
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MCQs

Old questions (1 mark)

2	Types of neuroglial cells	Aug 21
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GENERAL EMBRYOLOGY

SHORT ESSAYS

1	Describe the formation, fate and embryological significance of primitive streak.	Oct 24
2	Describe the process of implantation and common abnormal sites of implantation	Jul 24
3	Describe the process of neurulation. Name the vesicles in the cranial expanded part of the neural tube and mention their fate.	Jul 24
4	Development of placenta and its associated anomalies.	Jul 24, Mar 21, Aug 15, Aug 14
5	Formation of placenta	Jan 24
6	Formation and fate of notochord.	Nov 23, May 23
7	Graafian follicle	Jul 23
8	Process of implantation and its clinical aspects	Feb 23
9	Implantation	Feb 23
10	Divisions and derivatives of intraembryonic mesoderm.	Feb 22
11	Notochord	Feb 22
12	Stages and consequences of fertilisation	Aug 21

13	Placenta	
14	Intra embryonic mesoderm	Mar 21
15	Neural crest	Nov 20, Jan 20, Aug 13
SHORT NOTES		Aug 16
16	Describe fertilization and its results	
17	Development of interatrial septum	Oct 24
18	Formation and fate of primitive streak	Jan 24, Aug 19
19	Parts of blastocyst.	Jan 24, Aug 21
20	Oogenesis	Jan 24
21	Subdivisions and derivatives of neural tube	Nov 23, Sep 21, Aug 16
22	Formation and structure of umbilical cord.	May 23
23	Embryological basis of twinning	May 23
24	Neural crest cells.	Feb 23
25	Spermatogenesis.	May 22
26	Decidua	Feb 22
27	Yolk sac	Nov 20
28	Graafian follicle	Aug 19, Jan 19
29	Zona pellucida	Aug 19
30	Right atrial development	Jan 19
31	Inter ventricular septum	Aug 16
32	Somites	Aug 18, feb 16
33	Neural crest derivatives	Aug 16, Feb 17, Aug 18
34	Chorionic villi	Feb 16
35	Development of lungs	Feb 15, Feb 16
36	Dizygotic twins	Feb 14
37	Fertilisation	Feb 14
38	Neural tube	Aug 13
39	Spermiogenesis	Aug 12
40	Implantation	Aug 18, Feb 17, Aug 11

MCQs

single response type questions

41	At the caudal end of the primitive streak, ectoderm and endoderm meet at the: a) Coelom b) Cloacal membrane c) Neural groove d) Notochord	Jul 24
42	The ovum is surrounded by a non-cellular layer known as the: a) Corona radiata b) Theca folliculi c) Zona pellucida d) Cumulus oophorus	Jul 24

multiple response type questions

42	Which of the following statement/s is/are true about notochord 1) Forms the central axis of embryonic disc	Oct 24
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DECIPHER-I

2) Develops between prochordal plate & primitive streak from Hensen's node	
3) It's remnants are seen in the form of annulus fibrosus of intervertebral discs	
4) Induces formation of neural tube	d) 2,3
a) 1,2,3 b) 1, 3, 4 c) 1, 2, 4	
44 Origin from neural crest:	Jul 24
i. Schwann cells ii. Neural tube	
iii. Melanoblasts iv. Suprarenal medulla	
a) i, ii, iii b) i, iii, iv c) i, ii, iv d) ii, iii	
Old questions (1 mark)	Nov 23
45 Types of decidua	Nov 23, May 22,
46 Developmental sources of interatrial septum.	Feb 22
47 Maternal and fetal contribution to development of placenta	Feb 23
48 Structure that develops from left horn of sinus venosus	Feb 23
49 16 celled stage of embryo	Feb 23
50 Structures present in tertiary villus of placenta.	May 22
51 Structure hooking ligamentum arteriosum	May 22
52 Name two fetal membranes	May 22
53 Sites of ectopic pregnancy.	Feb 22
54 Parts of placenta.	Feb 22
55 Derivatives of intraembryonic coelom	Aug 21
56 Sources of development of arch of aorta	Mar 21, Aug 21
57 Any four derivatives of neural crest cells	Mar 21

GENETICS

SHORT ESSAYS

1 With the help of pedigree charts describe the various modes of inheritance involving the sex chromosomes. Give suitable examples for each type.	Oct 24
2 Describe the structure of chromosomes with classification. Explain any three structural anomalies of chromosomes	Jul 24
3 Karyotyping	Nov 23
4 Describe the technique of karyotyping with its applications.	Feb 23
5 Numerical aberrations of chromosomes	Feb 23
6 Chromosomal aberrations.	Feb 22
7 Describe various modes of inheritance with examples	Aug 21
8 Mendelian inheritance	Mar 21, Jan 18
9 Down syndrome	Jul 17

SHORT NOTES

10 Explain autosomal dominant inheritance in genetic diseases	Jul 24
11 Karyotype and clinical features of Klinefelter syndrome	Jul 24
12 Karyotyping	Jan 24, Jul 23, Jan 20, Nov 20

DECIPHER-I

ANATOMY-I

13 Define Karyotype. What are the steps of Karyotyping.	Jan 24
14 Trisomy 21	Feb 23
15 Describe structure of chromosome with classification.	May 22
16 Chromosomes and its classification	Feb 22
17 Name the structural chromosomal abnormalities	Sep 21
18 Barr body	Sep 21, Feb 17, Feb 15, Aug 14
19 Genetic counselling	Mar 21
20 Chromosomal aberrations	Aug 19
21 Numerical chromosomal abnormalities	Aug 18
22 Down syndrome	Aug 15, Aug 16
23 Reciprocal translocation	Feb 14
24 Klinefelter's syndrome	Aug 13
25 Turner's syndrome	Jan 19, Feb 16, Aug 11

MCQs

single response type questions

26 Mitochondrial DNA in humans is	Oct 24
a) Exclusively inherited maternally	
b) Exclusively inherited paternally	
c) Inherited both paternally and maternally	
d) Not inherited	

Old questions (1 mark)

27 Name the chromosomal defect in the Down's syndrome	Nov 23
28 Stage of meiosis I at which oogenesis is arrested	May 23
29 Two diseases showing autosomal dominant inheritance	Feb 23
30 Name two autosomal recessive disorders.	May 22
31 Karyotype of Turner's syndrome.	Feb 22

GENERAL HISTOLOGY

SHORT ESSAYS

1 Describe the structure of transitional epithelium with site of occurrence and its functional significance	Oct 24
2 Illustrate and describe the microscopic anatomy of the large artery and medium-sized artery highlighting how their structure is suited for their function	Jul 24
3 Histology of thin skin. Write a note on appendages of skin.	Jan 24
4 Explain the microscopic structure of thin skin	Nov 23
5 Classify muscular tissue with suitable examples. Describe the structure of skeletal muscle.	Mar 21

SHORT NOTES

6 Transitional epithelium	Jul 24, Jan 20
7 Microscopic structure of peripheral nerve	Jul 24
8 Microscopic structure of thymus	Jan 24, Feb 22, Nov 20, Feb 15,

ANATOMY-I

DECIPHER-I

		Aug 16
		Jan 24
9	Histologic difference between Cardiac and Skeletal Muscles.	Nov 23, Aug 21
10	Microscopic structure of spleen	Jul 23
11	Microscopic structure of hyaline cartilage	Feb 23
12	Microscopic structure of large artery and correlate with its function	Feb 23, Mar 21, Aug 18
13	Microscopic Structure of compact bone	Feb 23
14	Microscopic structure of Elastic artery	Sep 21
15	Labeled diagram of histology of hyaline cartilage	Aug 19
16	Microscopic structure of skeletal muscle	Jan 19
17	Large artery	Feb 17
18	Lymph node	Aug 15, Feb 16
19	Muscular artery	Aug 14
20	Bone	Feb 14
21	Spinal ganglion	Aug 11, Jan 18
22	Hyaline cartilage	Aug 12
23	Hyaline cartilage and locations	

MCQs

Assertion (A) and Reason (R)

24	(A): Skeletal muscle fibers are long cylindrical and multinucleated. (R): Each fiber is formed by the fusion of many myoblasts. a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Jul 24
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multiple response type questions

25	Regarding the microscopic structure of lymph node i. Cortex, paracortex and medulla can be recognised ii. An eccentric arteriole is present within the lymphatic nodules iii. A subcapsular sinus can be recognised iv. Malpighian corpuscles can be recognised a) i, ii, iii b) i, iii c) i, ii, iv d) ii, iii	Jul 24
26	Stratified squamous nonkeratinised epithelium is found in i. Cornea ii. Epiglottis iii. Vasdeferens iv. Vocal cords a) i, ii, iii b) i, ii c) i, iv d) i, ii, iv	Jul 24

Old questions (1 mark)

27	Layers in a medium sized artery	Jan 24
28	Name the epithelium lining blood vessel.	Feb 22

UPPER LIMB

BONES

SHORT NOTES

1	Contents of radial groove	Jan 24
2	Spiral groove	Feb 23
3	Coracoid process of scapula	Jan 18, Feb 15,

DECIPHER-I

ANATOMY-I

PECTORAL REGION

Aug 14

LONG ESSAYS

1	Describe the mammary gland under the following headings: extent, deep relations, gross structure, arterial supply and lymphatics.	Jul 24
2	A 55-year-old female presented to general surgery outpatient department with pain in left axilla and swelling of left upper limb. On clinical examination the surgeon noted the presence of few enlarged swellings in her left axilla and a swelling in upper lateral quadrant of her left breast. With your knowledge in anatomy, answer the following questions. • Which group of axillary lymph nodes could be enlarged in this patient. • Describe the anatomical groups of axillary lymph nodes and specify their areas of drainage. • Describe the lymphatic drainage of mammary gland. • Enumerate the boundaries and contents of axilla.	Feb 23

3	A painter experienced difficulty in raising the right arm upwards. The physician asked the patient to press his hands against the wall in front. It was found that the medial border and inferior angle of right scapula became prominent. • Name the muscle tested in this person to detect the injury to which nerve. • What is the name of the deformity. • What is the origin and root value of this nerve. • How this nerve gets damaged • What are the attachments and actions of this muscle.	Feb 22
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SERRATUS ANTERIOR

4	A 45 years old nulliparous woman reported to the OPD with two small palpable nodules in her left axilla. She was admitted, investigated and taken up for mastectomy (left) in the same week. With your knowledge of anatomy answer the following questions: • What could be the probable diagnosis? • What could be the nodule in the axilla and why? • Describe the blood supply and lymphatic drainage of the breast . • Mention the development and developmental anomalies of the breast .	Jan 20
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DIAGNOSIS : BREAST CARCINOMA

SHORT ESSAYS

5	Lymphatic drainage of mammary gland	Jul 24, Aug 19, Aug 11
6	Serratus anterior	Jan 24
7	Lymphatic drainage of mammary gland and its applied significance.	Feb 22

SHORT NOTES

8	Name four structures piercing clavi-pectoral fascia	Sep 21
9	Pectoralis minor	Mar 21
10	Lymphatic drainage of breast	Nov 20

MCQs

Assertion (A) and Reason (R)

11	A) Examination of breast in a case of breast carcinoma reveals peau d'orange appearance of skin R) Retraction of pits of hair follicles beneath edematous skin following blockage of lymphatics draining the skin. a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Oct 24
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Old questions (1 mark)

12	Two structures piercing Clavipectoral fascia.	Jan 24
13	The nerve injury which leads to winging of scapula.	Feb 22

AXILLA

LONG ESSAYS

1	Assisted delivery was required during the birth of a baby at term. The manoeuvre involved an unusually wide stretching at the neck shoulder angle. The neonate on examination by a neurologist showed upper brachial plexus injury. Answer the following • Describe formation and branches of brachial plexus • Explain the anatomical basis of the above lesion	Jul 17
2	Describe the brachial plexus under following headings. • Formation • Relations • Branches • Applied anatomy.	Mar 21

SHORT ESSAYS

3	Axillary artery	Feb 15, Feb 17
4	Brachial plexus	Feb 14, Jan 19

SHORT NOTES

5	Axillary lymph nodes	Feb 17, Aug 13
6	Axillary artery	Aug 15, Aug 12, Nov 20
7	Erb's point	Jan 18
8	Erb's paralysis	Feb 15

DRAW AND LABEL

9	Relations of first part of axillary artery	Feb 23
10	Brachial plexus	Aug 15, Aug 13

MCQs

Assertion (A) and Reason (R).

11	(A): The axillary vein can freely expand during increased venous return (R): There is no or very thin axillary sheath around the axillary vein. a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Jul 24
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12	(A): Dissection of lymph nodes near the subscapular artery may result in paralysis of the latissimus dorsi muscle. (R): The lower subscapular nerve supplies the latissimus dorsi muscle. a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Jul 24
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DELTOID AND SCAPULAR REGION

SHORT ESSAYS

1	Axillary nerve	Feb 23
2	Intra muscular spaces of scapular region	Aug 14
3	Deltoid muscle and its deep relations	Aug 13

SHORT NOTES

4	Trapezius muscle	Jul 24
5	Quadrangular intermuscular space	Jul 23
6	Biceps brachii muscle	Feb 23
7	Axillary nerve	Mar 21

MCQs

8	Two contents of quadrangular space	Nov 23
9	Contents of quadrangular space.	Feb 22

SHOULDER JOINT

LONG ESSAYS

1	Describe shoulder joint under the following headings:- a) Articular surfaces b) Structures stabilizing the joint c) Movements and muscles producing each movement d) Applied importance	Oct 24
2	A patient was brought with complaints of inability to abduct the right arm. On inspection, bulging in the upper part of the arm was observed a) Name the joint involved b) Write on the ligaments of the joint c) Write on the relations of the joint d) Write on the movements of the joint with muscles helping in the movements	Jan 24
3	A 50 years old man came to the casualty with complaints of pain at the shoulder joint. Answer the following questions: • Name the bones forming the joint • Ligaments • Movements and muscles causing them • Blood supply • Nerve supply • Applied aspects	Sep 21
4	A football player dislocated his right shoulder while playing. After one month of treatment, he noticed right shoulder was less prominent than the left and there was difficulty to abduct. • Mention the anatomical features making the shoulder to joint more prone for dislocation • What is the cause for flattening of shoulder in this case and difficulty to	Feb 16

DECIPHER-I

ANATOMY-I

- abduct ?
- Name the movements occurring at the shoulder joint and muscles producing these movements
 - State the reason, why head of the humerus is often displaced downwards?

Aug 12

- 5 A football player fell heavily and dislocated his right shoulder joint while playing. A collar and cuff support was given, after reducing the dislocation. Subsequently an orthopedic surgeon noticed that his right shoulder was less prominent than the left. The player was finding it difficult to abduct the arm to the horizontal level. Based on your anatomical knowledge answer the following questions:
- What anatomical features make the shoulder joint particularly prone to dislocation
 - Briefly describe the most stabilizing structure of the joint and why the head of the humerus is often displaced downwards.
 - In this case, what is the cause of subsequent flattening of the right shoulder and the difficulty in abducting the arm to a horizontal level.
 - Briefly mention the ligaments and the muscles acting at the shoulder joint.

SHORT ESSAYS

- | | | |
|---|--------------------------------|------------------------|
| 6 | Ligaments of shoulder joint | Jul 23 |
| 7 | Rotator cuff of shoulder joint | Feb 16, Aug 12, Aug 11 |

SHORT NOTES

- | | | |
|---|--------------------------------|----------------|
| 8 | Rotator cuff of shoulder joint | Nov 20, Jul 17 |
|---|--------------------------------|----------------|

DRAW AND LABEL

- | | | |
|---|-----------------------------------|--------|
| 9 | Sagittal section through shoulder | Mar 21 |
|---|-----------------------------------|--------|

ARM

LONG ESSAYS

- | | | |
|---|---|--------|
| 1 | A Patient was brought to the clinic with a history of giddiness since one week. The physician asked the junior doctor to check the blood pressure. It was found that blood pressure was high.
a) Name the artery used to monitor the blood pressure
b) In which fossa is the bell of the stethoscope placed
c) Give the boundaries of the fossa
d) Mention the contents of the fossa in detail | Jul 23 |
| 2 | A 35-year-old rowdy sheeter involved in a fight received a deep cut in the middle of the back of his right arm. He was bleeding profusely and was rushed to the hospital.
• Which nerve and artery at this site are in danger of injury.
• What is the origin and termination of this artery.
• How will you assess the functional integrity of the nerve in this case.
• Which part of the brachial plexus gives origin to this nerve and which other nerves arise from this part. | May 23 |

DECIPHER-I

ANATOMY-I

- | | | |
|---|--|--------|
| 3 | • Give the motor distribution and cutaneous branches of this nerve.
Describe cubital fossa under following headings.
• Boundaries • Contents • Clinical importance | Aug 21 |
|---|--|--------|

SHORT ESSAYS

- | | | |
|---|---------------|--------|
| 4 | Cubital fossa | Aug 18 |
|---|---------------|--------|

SHORT NOTES

- | | | |
|---|--|----------------|
| 5 | Boundaries and contents of cubital fossa | Jul 24 |
| 6 | Cephalic vein | Feb 22 |
| 7 | Brachial artery | Aug 18 |
| 8 | Median cubital vein | Aug 18, Aug 16 |

DRAW AND LABEL

- | | | |
|----|--------------------------------|--------|
| 9 | Section through middle of arm | Feb 22 |
| 10 | Anastomosis around elbow joint | Feb 14 |

MCQs

Old questions (1 mark)

- | | | |
|----|--|--------|
| 11 | Three superficial veins of upper limb. | Jan 24 |
| 12 | Vein present on the roof of cubital fossa. | May 22 |
| 13 | Name any four branches of brachial artery | Mar 21 |

FOREARM

SHORT ESSAYS

- | | | |
|---|--|--------|
| 1 | Movements and the muscles involved in causing each movement at the wrist joint | Nov 23 |
| 2 | Radio-ulnar joints. | May 22 |
| 3 | Supination and pronation. | Feb 22 |

SHORT NOTES

- | | | |
|---|------------------------------|----------------|
| 4 | Posterior interosseous nerve | Jul 24, Aug 11 |
| 5 | Extensor retinaculum of hand | Jan 24 |
| 6 | Supination and pronation | Feb 16 |

MCQs

Old questions (1 mark)

- | | | |
|---|---|--------|
| 7 | Name the muscles supplied by ulnar nerve in the forearm | Aug 21 |
|---|---|--------|

HAND

SHORT ESSAYS

- | | | |
|---|--|----------------|
| 1 | Flexor retinaculum of hand and its clinical implications | Aug 21, Aug 18 |
| 2 | Carpometacarpal joint of thumb | Nov 20 |
| 3 | Ulnar nerve in hand | Aug 19, Feb 15 |
| 4 | Palmar fascial spaces | Feb 17, Aug 16 |
| 5 | Superficial palmar arch | Aug 15 |

SHORT NOTES

- | | | |
|----|--|--------|
| 6 | Describe boundaries and contents of anatomical snuff box | Oct 24 |
| 7 | Claw hand | Nov 23 |
| 8 | Flexor retinaculum of hand | Jul 23 |
| 9 | Anatomical basis of claw hand. | May 23 |
| 10 | Palmar aponeurosis | Feb 22 |

DECIPHER-I

11	Superficial palmar arch	Sep 21, Jan 19, Jan 18
12	Midpalmar spaces	Mar 21
13	Wrist joint	Mar 21
14	First carpometacarpal joint	Jan 20
15	Deep palmar arch	Aug 18
16	Interossei of hand	Feb 14
17	Carpal tunnel	Aug 14
18	Adductor pollicis	Feb 15
19	Lumbricals	Aug 15
20	Anatomical snuff box	Feb 16
21	Flexor retinaculum	Aug 12

DRAW AND LABEL

22	Diagram of dorsum of hand showing sensory innervation	Jul 23
23	Oblique section through hand to show fascial spaces	Aug 19
24	Palmar arterial arches	Feb 15, Aug 12, Aug 11
25	Superficial and deep palmar arches of hand	Feb 17, Aug 13

MCQs

Old questions (1 mark)

26	Action of Lumbricals in the hand.	Jan 24
27	Floor of anatomical snuff box	May 23

NERVES

LONG ESSAYS

1	A 45 year old man was brought to the casualty following a road traffic accident. He had pain and swelling over his right arm. On clinical examination it was found that he was unable to extend his right wrist joint and joints of his right hand and also sensory loss on dorsum of right hand. X-ray of his right arm showed fracture shaft of humerus. With your knowledge in anatomy answer the following questions • Name the nerve injured in this patient. • Give the root value of the nerve. • Describe the course of the nerve. • Name the branches given off by the nerve specifying the sites of origin. • What is the reason behind the patient's inability to extend wrist joint and other joints of right hand.	May 22
2	A 45 year old man was brought to the casualty with a fracture of shaft of the humerus. On examination he had impaired extension of the wrist. There was also impaired sensation over the dorsum of the forearm and lateral aspect of the hand. • Name the structure involved and site of injury • Mention its origin, course and distribution • Mention its branches at different levels	Jan 19

DECIPHER-I

	• Mention the reasons for loss of sensation • Name the accompanying blood vessel at the site of the injury	
	DIAGNOSIS : RADIAL NERVE	
3	A 25 year old cricket player sustained injury in his left arm. On X-ray examination, a fracture of shaft of humerus was observed. Following internal reduction of fracture, he was not able to extend his left wrist. Based on knowledge in anatomy answer the following questions. • Injury to which nerve produce inability to extend wrist • Briefly describe the origin, course and distribution of the nerve involved • Name the other nerves related to humerus and mention appropriate sites	Aug 16
	DIAGNOSIS : RADIAL NERVE	
SHORT ESSAYS		
4	Radial nerve- root value, course and branches in axilla, arm and cubital fossa. What is Saturday night palsy	Jan 24
5	Radial nerve	Feb 22
6	Median nerve	Feb 16
7	Ulnar nerve	Aug 16
SHORT NOTES		
8	Explain the anatomical basis of carpal tunnel syndrome	Jul 24
9	Compartments deep to extensor retinaculum of hand	Feb 23
10	Anatomical basis of claw hand.	Feb 22
11	Anterior interosseous nerve	Jan 19
MCQs		
case scenario-based questions		
12	A 36 year-old male after a weekend party came home and slept off seated on a chair, with his right arm over the back of the chair all through the night. Next day he experienced difficulty in some movements of his wrist and fingers of right limb and sensory disturbances over a small area in the lateral part of dorsum of right hand. i. Which group of muscles most typically become weakened in this condition a) Dorsal interossei b) Extensors of wrist c) Flexors of wrist d) Palmar interossei ii. Which is the nerve likely to be compressed here a) Median b) Radial c) Musculocutaneous d) Ulnar iii. Name the part of brachial plexus that gives origin to the nerve that is likely to be compressed in this patient a) Upper trunk b) Medial cord c) Lateral cord d) Posterior cord iv. All the following form boundaries of spiral groove of humerus EXCEPT: a) Shaft of humerus b) Anconeus c) Medial head of triceps d) Lateral head of triceps v. All the following are branches of the involved nerve EXCEPT	Oct 24

- a) Upper lateral cutaneous nerve of arm
b) Lower lateral cutaneous nerve of arm
c) Posterior cutaneous nerve of forearm
d) Posterior cutaneous nerve of forearm

multiple response type questions

- 13 In the arm
i. Brachialis may be partly innervated by the radial nerve
ii. The radial nerve pierces the lateral intermuscular septum above the origin of brachioradialis
iii. The ulnar nerve pierces the medial intermuscular septum below the insertion of coracobrachialis
iv. The lateral cutaneous nerve of the forearm is given off by the radial nerve in the spiral groove
a) i, ii, iii b) i, iii, iv c) i, ii, iv d) ii, iii

Jul 24

Old questions (1 mark)

- 14 The nerve that continues as lateral cutaneous nerve of forearm. Jan 24
15 Two muscles supplied by anterior interosseous nerve Nov 23
16 What is the root value of radial nerve Nov 23
17 Name the muscles supplied by axillary nerve. May 23
18 Nerve passing superficial to flexor retinaculum of hand Feb 23
19 Contents of anatomical snuff box Feb 23
20 Cutaneous nerve supply of lateral border of forearm. May 22
21 Nerve compressed in Saturday night palsy Aug 21
22 Nerve involved in carpal tunnel syndrome Mar 21

HEAD AND NECK

BONES

SHORT NOTES

- 1 Structures passing through foramen magnum Jul 24
2 Jugular foramen Jan 24, Jul 23
3 Styloid process Feb 23, Jan 19, Feb 17
4 Foramen Magnum Feb 22

MCQs

Old questions (1 mark)

- 5 Structures passing through the foramen ovale Jan 24
6 Stapedius attached to this structure. May 23
7 Name two structures passing through foramen ovale Aug 21

SCALP

SHORT ESSAYS

- 1 Name the layers of the scalp. Why do scalp wounds bleed profusely. Jul 24
Which layer is considered the dangerous layer and why
2 Layers of scalp with clinical implications Mar 21

MCQs

Assertion (A) and Reason (R)

- 3 A) Scalp wounds are painful but heal quickly.
R) Scalp is richly supplied by sensory nerves and is highly vascular
a) Both A and R are true, and R is the reason for A
b) Both A and R are true, and R is not the reason for A
c) A is correct but R is incorrect
d) A is incorrect but R is correct

Oct 24

Old questions (1 mark)

- 4 Dangerous layer of scalp.

May 23, May 22

FACE

SHORT ESSAYS

- 1 Muscles of mastication May 23
2 Temporomandibular joint Feb 23
3 Orbicularis oculi muscle Jul 17

SHORT NOTES

- 4 Orbicularis oculi muscle Aug 19
5 Extra cranial branches of facial nerve Aug 19
6 Facial artery Jan 19
7 Routes of spread of infection from dangerous area of face to cavernous sinus Aug 15

DRAW AND LABEL

- 8 Distribution of cutaneous nerves to head and neck Mar 21, Aug 15

MCQs

Assertion (A) and Reason (R)

- 9 A) Muscles of mastication are innervated by facial nerve
R) Muscles of mastication develop from mesoderm of 1st pharyngeal arch.
a) Both A and R are true, and R is the reason for A
b) Both A and R are true, and R is not the reason for A
c) A is correct but R is incorrect
d) A is incorrect but R is correct

Oct 24

PAROTID GLAND

LONG ESSAYS

- 1 A 35 year old female came with a history of swelling below the ear lobule on right side. The swelling was associated with pain.
a) Which is the structure involved.
b) What are the coverings, surfaces and borders of the structure.
c) What are the structures passing through it.
d) Write the secretomotor pathway of the structure. Jul 23
- 2 A 50-year-old man presented with a history of rapidly growing painful swelling on the face below the ear lobule on the left side. On examination the left ear lobule was found to be lifted by the swelling. There was an inability to close the left eye and to blow the cheek. The angle of mouth was deviated to the right side.
• Name the surfaces, borders and structures related to the affected organ Feb 23

DECIPHER-I

ANATOMY-I

	• Give the nerve supply of the organ • Correlate the symptoms seen in relation to the anatomical structures	Feb 22
3	A 70-yr-old man presented with a rapidly growing swelling below the ear lobule on the left side. The left ear lobule is lifted due to swelling. The person was unable to close the left eye and blow his mouth. Angle of mouth deviated to right side. • Which is the gland enlarged • What major structures pass through this gland • Name the surfaces and relations of this gland. • Which nerve is involved in this case. Give the extracranial distribution by this nerve.	

4	A 58 year old man presented with rapidly growing swelling of parotid gland. On examination, there was an inability to close the left eye and blow the cheek. The angle of mouth was deviated to right side. Based on your anatomical knowledge answer these : • External features and secretomotor pathway of parotid gland • Name the structures within the gland and which of these injured in this patient • What is the reason for inability to close the eye and blow the cheek • Mention the course of parotid duct and structures pierced by it	Feb 16
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5	A 55 year old man presented with a rapidly growing swelling on the left side of his face just below the ear lobule. On examination, the ear lobule was found to be lifted by the swelling. Following surgical excision of the swelling, the person found difficult to close the left eye and blow the cheek. The angle of mouth was deviated to the right. Based on your knowledge in anatomy, answer the following • which anatomical structure is likely to be involved to form the swelling • Briefly describe the external features, relations and blood supply of structures involved • Accidental injury to which nerve is probable cause of man's difficulties • Briefly explain the reasons for the disabilities	Aug 15
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SHORT ESSAYS

6	Parotid gland relations	Jul 24
7	Parotid gland	Aug 19

SHORT NOTES

8	Anatomical basis of inability to close the right eye following surgery on right parotid gland	Oct 24
9	Structures related to antero lateral surface of parotid gland	Aug 16

MCQs

Old questions (1 mark)

10	Area of supply of Chorda Tympani nerve	Feb 23
11	Name any two structures within the parotid gland	May 22

SUBMANDIBULAR GLAND

LONG ESSAYS

1	A patient had a swelling below the lower jaw on the right side. The	Aug 16
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DECIPHER-I

ANATOMY-I

	swelling increases in size during eating. The surgeon did a bi-digital examination of the swelling. Based on anatomical knowledge answer these - • Which gland is palpated and what is the cause? • Name the parts of this gland and muscle separating them • Mention the relations of this gland • What is the length of its duct and where does it open? • Draw a diagram to secretomotor innervation • Microscopic structure of the gland	
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SHORT ESSAYS

2	Parts, relations and nerve supply of submandibular salivary gland	May 22
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SHORT NOTES

3	Nerve supply of sub mandibular salivary gland	Mar 21
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THYROID GLAND

LONG ESSAYS

1	A 39-year-old female presents to the clinic for a routine health maintenance exam. The patient reports she is feeling nervous and anxious all the time with frequent palpitations, diarrhea and has been losing weight. She has also noticed a change in hair and fingernail. She frequently feels warm while others are cold or comfortable. On examination her heart rate is 110 beats per minute. She has a slight Tremor and has increased reflexes in all extremities. A nontender thyroid enlargement is appreciated in the thyroid region. She was diagnosed with hyperthyroidism after biochemical tests. Based on your anatomical knowledge answer the following: • Parts and relations of thyroid gland. • Blood supply of thyroid gland. • Explain the embryological basis for possible abnormal locations of the thyroid gland. • Microscopic structure of thyroid gland.	May 23
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2	A 30 years old female visited to the surgical out-patient department with complaints of pain and swelling in the lower part of front of neck. On examination the swelling moves with deglutition. Based on the history and clinical examination a provisional diagnosis of thyroid swelling was made. With your knowledge in anatomy answer the following questions related to thyroid gland. • Reason for thyroid swelling moves with deglutition. • Describe the parts, coverings, relations, blood supply and lymphatic drainage of thyroid gland. • Microstructure of thyroid gland.	Feb 22
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3	A 32 years old woman presented with a swelling in front of her neck and that was moving up and down during swallowing. Following surgical removal of the swelling, she noticed a change in her voice. Based on your knowledge in anatomy, answer the following questions: • Name the structure that causes the swelling and give the reason why it	Sep 21
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	- moves up and down during swallowing. - Briefly describe the gross anatomical features, relations and the blood supply of the structure involved. - What could be the probable cause for a change in her voice following surgery. - What precautions should be taken during surgery to avoid this complication	Jan 19
4	A 65 year old woman came to the hospital with swelling in front of the neck. It was moving with deglutition. After surgical excision of the gland, she had hoarseness of the voice. Answer the following. - Name the structure involved - Briefly describe coverings, external features, relations and blood supply - State the reasons for the up and down movement of the swelling - What's the cause of hoarseness of voice after the surgery - Add a note on development of the structure involved	Feb 14
5	55 year old woman complained of midline nodular swelling in the front of her neck which moves on swallowing. On examination, she had slight tremors on outstretched hands; pulse was 111 per min, BP 156/100 mm Hg and slight blurring of eyes. She also told that, she had lost weight and feels feverish. Answer the following questions - Which organ is likely to be involved - Why does this swelling move during swallowing - Mention the relations of this organ - Explain the blood supply of this organ and mention the precautions to be taken while ligating these vessels during surgery	
SHORT ESSAYS		
6	Thyroid gland – external features, relations, blood supply and development	Aug 15
7	Blood supply and microscopic structure of thyroid gland	Jan 18
SHORT NOTES		
8	Explain the surgical importance of thyroid gland	Jul 24
9	Blood supply of thyroid gland	Feb 23
10	Relations of thyroid gland	Feb 15
FASCIAS OF NECK		
SHORT NOTES		
1	Carotid sheath.	Sep 21
MCQs		
multiple response type questions		
2	Which of the following statement/s is /are true about carotid sheath 1) Anteriorly related to ansa cervicalis 2) Posteriorly related to cervical sympathetic chain 3) Extends from base of skull above to arch of aorta below 4) Thin over common carotid artery to allow expansion during increased venous return a) 1, 2, 3 b) 1,2 c) 1,4 d) 1,2,4	Oct 24

Old questions (1 mark)

3 Formation of carotid sheath.

Feb 22

TRIANGLES OF NECK

SHORT ESSAYS

1	Boundaries and contents of carotid triangle	Jan 24, Mar 21
2	Boundaries and contents of sub occipital triangle	Nov 23
3	Sternocleidomastoid muscle	Feb 23
4	Boundaries and contents of posterior triangle of neck	Feb 22

SHORT NOTES

5	Branches of external carotid artery	Jan 24, Jul 23, Feb 14
6	Contents of carotid triangle	Aug 19
7	Ansa cervicalis	Aug 18, Feb 17, Feb 15
8	Posterior triangle of neck	Aug 12

INFRATEMPORAL FOSSA

SHORT ESSAYS

1	Mandibular nerve	Aug 11
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SHORT NOTES

2	Middle meningeal artery.	Sep 21
3	Temporalis muscle	Jan 19

ORBIT

SHORT ESSAYS

1	Explain the attachments, nerve supply and actions of extra ocular muscles of eyeball	Oct 24
2	Extraocular muscles	Jan 24, Aug 21, Mar 21, Feb 16, Feb 15

SHORT NOTES

3	Describe anatomical basis of Horner's syndrome.	Feb 22
4	Superior orbital fissure.	Sep 21
5	Branches of ophthalmic artery	Nov 20
6	Extraocular muscles with nerve supply	Feb 17
7	Lacrimal apparatus	Aug 12
8	Levator palpebrae superioris	Aug 11

MCQs

Old questions (1 mark)

9	Nerves supplying lateral rectus and medial rectus	Jan 24
10	Structures producing aqueous humor	May 23
11	Structures passing through optic canal	May 22

EAR

SHORT ESSAYS

1	Tympanic membrane	Nov 20
2	Middle ear	Aug 18

DECIPHER-I

ANATOMY-I

SHORT NOTES

3	Contents of middle ear cavity	Jan 24
4	Tympanic membrane	Mar 21, Aug 14, Aug 11

MCQs

case scenario-based questions:

- 5 An 8-year-old boy gives history of chronic middle ear infection. During his recent episode infection spread to the mastoid antrum and the mastoid air cells.
- i. If left untreated, the infection can erode the thin layer of the bone between the mastoid air cells and the posterior cranial fossa and spread into which of the following sinuses
- a) Superior sagittal sinus b) Inferior sagittal sinus
c) Cavernous sinus d) Sigmoid sinus
- ii. Chronic middle ear infections have produced a lesion in the tympanic plexus in the middle ear cavity which will result in
- a) Diminished mucus in the nasal cavity
b) Diminished mucus on the soft palate
c) Diminished saliva production by the parotid gland
d) Diminished saliva production by the submandibular and sublingual glands
- iii. The tubotympanic recess, which forms the middle ear cavity develops from
- a) 1st and 2nd pharyngeal pouches b) 1st pharyngeal pouch
c) 1st pharyngeal arch d) 3rd pharyngeal pouch
- iv. The nerve closely associated with the tympanic membrane is
- a) Chorda tympani b) Lesser petrosal
c) Vestibulocochlear d) Facial
- v. The pyramid gives attachment to
- a) Stapedius b) Tensor tympani
c) Anterior ligament of malleus d) Short process of incus

Old questions (1 mark)

6	Lateral wall of middle ear.	May 22
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PALATE

SHORT NOTES

1	Muscles of soft palate and their nerve supply	Jul 24, Nov 20, Aug 12
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2	Soft palate	Feb 17
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MCQs

Old questions (1 mark)

3	Name two muscles of soft palate	Nov 23
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ORAL CAVITY

LONG ESSAYS

1	A 10-year-old girl underwent bilateral tonsillectomy for chronic tonsillitis. On examination, prior to discharge, the surgeon noted an absence of	Jul 24
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DECIPHER-I

ANATOMY-I

- touch sensation on the posterior $\frac{1}{3}$ of the tongue along with an absent gag reflex. Based on your knowledge of anatomy answer the following.
- a) Name the nerve damaged during the surgery
b) What are the external features on the posterior $\frac{1}{3}$ of tongue
c) Correlate the development of the tongue to its nerve supply
d) Briefly describe the histology of the tonsil
- 2 A 65-year-old man who was Chronic Smoker and Tobacco chewer for past 15 years, came to hospital with ulcerated lesion on the anterior part of the Tongue, which bleeds on touch. He was unable to swallow and foul smell was emitting from his mouth. O/E he had enlarged Submandibular and lower cervical lymph nodes. He was diagnosed with Carcinoma of the Tongue
- a) Based on anatomical knowledge, what are the external features of Tongue
b) Name the muscles of tongue with their nerve supply
c) Describe the Blood supply and Lymphatic drainage of Tongue
d) Explain the development of tongue

SHORT ESSAYS

3	Lymphatic drainage of tongue.	Jul 23
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SHORT NOTES

4	Nerve supply of tongue	Jul 24, Feb 22
5	Dorsum of tongue	Mar 21
6	Sensory innervation of tongue	Jul 17
7	Structures over hyoglossus	Aug 16, Feb 14
8	Motor and sensory innervation of tongue	Aug 13

DRAW AND LABEL

9	Hyoglossus muscle and its relations	Aug 21
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MCQs

Assertion (A) and Reason (R)

10	A) Taste from the circumvallate papilla of tongue is carried by the chorda tympani nerve R) Circumvallate papilla is located in the anterior two third of dorsal surface of tongue a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Oct 24
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NASAL CAVITY

SHORT ESSAYS

1	Lateral wall of nasal cavity	May 22
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SHORT NOTES

2	Draw diagram of nasal septum	Jul 23
3	Lateral wall of nasal cavity	Aug 17
4	Middle meatus of nose	Feb 16, Aug 13

MCQs

DECIPHER-I

ANATOMY-I

Old questions (1 mark)

5	Name the Sinuses opening into the Middle meatus	Nov 23
6	Two bones forming major part of nasal septum.	May 23
7	Name two openings in middle meatus of nose ring	Feb 23
8	Where does the naso lacrimal duct open in to	Aug 21
9	Openings in hiatus semi lunaris	Mar 21

PHARYNX

SHORT ESSAYS

1	Auditory tube	Aug 19
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SHORT NOTES

2	Nasopharynx	Jan 24, Sep 21, Jan 20
3	Features of nasopharynx	Nov 23
4	Constrictors of pharynx	Jul 23
5	Auditory tube	Feb 23
6	Sphincter muscles of pharynx	Aug 18
7	Pharyngeal constrictions	Jan 18

MCQs

Old questions (1 mark)		Feb 23
8	Two features of lateral wall of nasopharynx	

LARYNX

LONG ESSAYS

1	4 year old child swallowed a shirt button. Since the child began to suffocate she was rushed to the hospital, where on X-ray examination, impaction of the foreign body in the larynx was confirmed. Based on your knowledge, Answer the following • Which is the narrowest part of laryngeal cavity? • Briefly describe the interior of larynx • Which is the safety muscle of larynx? • Name the joints at which the muscles of larynx act and briefly mention the movements taking place at these joints • What anatomical structures in the midline of neck are encountered during surgical approach to trachea below isthmus of thyroid gland	Aug 12
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SHORT ESSAYS

2	Interior of larynx	Aug 13
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SHORT NOTES

3	Boundaries and clinical significance of pyriform fossa.	May 23
4	Cavity of larynx	Feb 22
5	Interior of larynx	Nov 20, Aug 11
6	Piriform recess	Aug 15

DRAW AND LABEL

7	Transverse section through the neck at level of cricoid (C6 vertebrae)	Feb 23
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MCQs

DECIPHER-I

ANATOMY-I

Old questions (1 mark)

8	Name two cartilages of Larynx	Nov 23
9	Structures piercing thyrohyoid membrane	Feb 22
10	Name two unpaired laryngeal cartilages.	Feb 22

BLOOD SUPPLY OF HEAD & NECK

SHORT ESSAYS

1	Describe the formation, termination, tributaries and clinical importance of external jugular vein	Oct 24
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SHORT NOTES

2	Branches of subclavian artery	Feb 22
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MCQs

Old questions (1 mark)

3	External jugular vein formed by	May 23
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VERTEBRAL JOINTS

SHORT NOTES

1	Mention the type and movements at atlanto-occipital joints	Feb 16
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CRANIAL NERVES

LONG ESSAYS

1	A 20 years old female underwent right sided mastoidectomy following which she developed weakness of facial muscles on that side. There was also impairment of taste sensation from the anterior two thirds of the tongue on the same side. Based on your knowledge of anatomy, Answer the following questions: • Name the structure involved during surgery that would have led to the symptoms in this patient. • Name all the nuclei in the brain stem which are concerned with this structure • Describe the intracranial, intra petrous and extra cranial course of the structure. • Name its branches at different levels	Jan 20
2	A college student was brought to casualty with history of road traffic accident. Among other clinical findings there was evidence of injury of the facial nerve on the right side. From your knowledge of anatomy ,Answer the following • Describe the extra cranial course, relations, branches and distribution of the facial nerve • What clinical features are expected to be seen if the nerve is injured as it emerges from the stylomastoid foramen	Jul 17

DIAGNOSIS: FACIAL NERVE

SHORT ESSAYS

3	Facial nerve	Mar 21
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SHORT NOTES

4	Explain anatomical basis of facial nerve palsy	May 22
5	Explain anatomical basis of wry neck	May 22
6	Chorda tympani nerve	Feb 15

MCQs

single response type questions

7	The following muscle is supplied by the glossopharyngeal nerve a) Stylopharyngeus b) Palatopharyngeus c) Salpingopharyngeus d) Superior constrictor	Oct 24
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multiple response type questions

8	The nucleus tractus solitarius is concerned with the following cranial nerves i. Facial ii. Vestibulo-cochlear iii. Glossopharyngeal iv. Vagus a) i, ii, iii b) i, iii, iv c) i, ii, iv d) ii, iii	Jul 24
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Old questions (1 mark)

9	Nerves supplying digastric muscle	Jan 24
10	Nucleus receiving taste sensation.	May 23

NEUROANATOMY

CNS - OVERVIEW

SHORT NOTES

1	DRAW AND LABEL: Median section of brain.	Sep 21
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MCQs

Old questions (1 mark)

2	Name two contents of interpeduncular fossa.	Feb 22
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SPINAL CORD

SHORT ESSAYS

1	External features and blood supply of spinal cord	Aug 21
2	Spinal cord- gross features ,blood supply ,and vertebral levels of spinal segments	Aug 12

SHORT NOTES

3	Coverings and blood supply of spinal cord	Jul 24
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MCQs

single response type questions

4	Transection of the lateral spinothalamic tract results in: a) Loss of pain and temperature sensation b) Complete flaccid paralysis c) Spastic paresis d) Cerebellar incoordination	Jul 24
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Old questions (1 mark)

5	Two modifications of spinal piamater	Nov 23
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BRAIN STEM

SHORT NOTES

1	Medial lemniscus	Jan 18
2	Crus cerebri	Aug 11

DRAW AND LABEL

3	Transverse section of medulla at the level of olive	Oct 24, Mar 21
4	Transverse section of medulla oblongata at the level of sensory decussation	Jul 24, Jan 24, May 22

5	Transverse section of midbrain at the level of superior colliculus.	Jul 24, Nov 23, Feb 22
6	Transverse section of the pons at the level of Facial colliculus	Jan 20
7	Transverse section of medulla at the level of pyramidal decussation	Jul 17, Feb 16
8	Transverse section at the level of lower part of pons	Aug 15
9	Transverse section at the level of upper part of pons	Feb 14
10	Transverse section at the level of inferior colliculus of midbrain	Aug 13

MCQs

single response type questions

11	Red nucleus is present in: a) Midbrain at the level of superior colliculus b) Midbrain at the level of inferior colliculus c) Pons at the level of facial colliculus d) Medulla oblongata at the level of pyramidal decussation	Oct 24
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Old questions (1 mark)

12	Four nuclei present in the pons	Jan 24
13	Name two cranial nerves at Ponto medullary junction	Nov 23
14	Two cranial nerve nuclei in midbrain.	May 23
15	Name two cranial nerve nuclei in lower part of pons	Feb 23
16	Name two cranial nerve nuclei in medulla oblongata	Aug 21
17	Structures producing facial colliculus	Mar 21

CEREBELLUM

SHORT ESSAYS

1	Gross anatomy of cerebellum with its nuclei	May 23
2	Cerebellar peduncles	Jan 18

SHORT NOTES

3	Superior cerebellar peduncle	Jan 20
4	Middle cerebellar peduncle	Aug 19
5	Inferior cerebellar peduncle	Feb 14
6	Deep cerebellar nuclei	Feb 16

MCQs

Old questions (1 mark)

7	Nuclei of cerebellum	Nov 23
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VENTRICLES OF BRAIN

SHORT ESSAYS

1	Fourth ventricle	Jan 24
2	Parts boundaries and features of lateral ventricle.	Feb 23
3	Lateral ventricle	May 22
4	Floor of fourth ventricle	Feb 22
5	Tela choroidea of fourth ventricle	Aug 15, Aug 14

SHORT NOTES

6	Floor of fourth ventricle of brain	May 23
7	Features in the floor of fourth ventricle.	Feb 22
8	Third ventricle	Jan 19

9	Tela choroidea of fourth ventricle	Feb 15
10	Lateral ventricle of brain	Jan 18
DRAW AND LABEL		
11	Floor of fourth ventricle	Jul 23, Nov 20, Feb 17, Aug 11

MCQs

Assertion (A) and Reason (R)

12	A) Third ventricle is bounded on either side by thalamus and hypothalamus R) Third ventricle develops from the cavity of mesencephalon a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Oct 24
13	(A): Cerebrospinal fluid is produced in the lateral ventricles of the brain. (R): The choroid plexus is situated only in the lateral ventricles. a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Jul 24

Old questions (1 mark)

14	Level of lumbar puncture	Feb 23
15	Two features in the floor of inferior horn of lateral ventricle	Aug 21

CEREBRUM

SHORT ESSAYS

1	Describe the Sulci, Gyri, functional areas and blood supply on the superolateral surface of cerebrum	Jan 24
2	Describe the Functional areas and Blood supply of Superolateral surface of Cerebral hemisphere	Nov 23
3	Functional areas of supero-lateral surface of cerebrum	Aug 14
4	Thalamus	Aug 11

SHORT NOTES

5	Broca's area	May 22
6	Functional areas of supero-lateral surface of cerebrum	Nov 20
7	Lateral sulcus of cerebrum	Aug 18
8	Pre central gyrus of cerebrum	Aug 13
9	Visual cortex	Aug 11

DRAW AND LABEL

10	Sulci and gyri of superolateral cerebral hemisphere.	May 23, Feb 22
11	Supero-lateral surface of cerebral hemisphere	Feb 15

MCQs

Old questions (1 mark)

12	Name two complete sulci of cerebrum	May 22
13	Broadmann's area for auditory cortex.	Feb 22

BLOOD SUPPLY OF BRAIN

SHORT ESSAYS

1	Formation and branches of circle of Willis	Feb 23
2	Circulous arterioles	Mar 21
3	Arterial supply and venous drainage of cerebral cortex	Jan 20

DRAW AND LABEL

4	Circle of Willis	Feb 23, Jan 19, Aug 18, Aug 14, Aug 12
5	Blood supply of medial surface of cerebrum	Aug 19
6	Blood supply of inferior surface of cerebrum	Aug 16

WHITE MATTER OF BRAIN

LONG ESSAYS

1	A 60-year-old male known hypertensive is on anti-hypertensive drug for 5 years, wakes up in the morning and notices difficulty in moving his right limbs. He was brought to emergency department. Neurological examination revealed right sided hemiplegia. CT scan revealed hemorrhage in the posterior limb of the left internal capsule. • Name the blood vessel responsible for the haemorrhage. • Discuss the white matter of cerebrum. • Parts and fibres of internal capsule. • Blood supply of internal capsule.	Mar 21
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SHORT ESSAYS

2	Classify white matter of the brain with an example of each. Describe the white matter bundle seen in the median longitudinal cerebral fissure	Jul 24
3	Internal capsule of brain	Jul 24
4	Association fibres of the cerebrum	Jul 23
5	Internal capsule- parts, fibre constituents, arterial supply and applied anatomy.	Feb 22
6	Internal capsule – parts, relations, ascending and descending fibers and applied anatomy.	Sep 21
7	Describe internal capsule	Aug 21, Aug 19, Feb 15
8	Association fibres of brain	Feb 17

SHORT NOTES

9	Internal capsule	Mar 21
10	Fornix of brain	Jul 17
11	Corpus callosum	Aug 12

MCQs

multiple response type questions

12	Which of the following artery/arteries supply internal capsule 1) Pontine arteries 2) Anterior choroidal artery 3) Middle cerebral artery 4) Labyrinthine artery a) 1,2,3 b) 1, 3, 4 c) 2,3 d) 1,2	Oct 24
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DECIPHER-I

Old questions (1 mark)

13 Name the type of fibers in corpus callosum.

May 22

BASAL GANGLIA AND LIMBIC SYSTEM

SHORT ESSAYS

- Describe parts, relations, connections and clinical anatomy of basal ganglia
- Basal nuclei
- Basal ganglia
- Corpus striatum

Oct 24

Aug 16

Feb 14

Aug 13

SHORT NOTES

- Parts of basal ganglia with functional importance

Aug 21

MCQs

Old questions (1 mark)

- Components of basal nuclei
- Basal nuclei

Jan 24

Mar 21

CRANIAL CAVITY AND CSF CIRCULATION

LONG ESSAYS

- A male patient was brought to emergency department with head injury following road traffic accident. On examination he was found to have black eye and pulsating exophthalmos on left side. On radiological examination fracture of body of sphenoid was noted.
a) What is the anatomical basis of black eye and pulsating exophthalmos in this patient
b) Name the dural venous sinus that is likely to be involved in this patient and describe its relations, tributaries and communications
c) Classify dural venous sinuses

Oct 24

- Classify dural venous sinuses. Describe the Cavernous sinus under the following headings

Jan 24, May 22
Aug 21

- Situation and extent
- Relations
- tributaries and communications
- applied anatomy

- A patient brought to casualty following road traffic accident had bulging of right eyeball with every radial pulse beat. X ray revealed fracture of right half of body of sphenoid. Answer the following questions

Jan 18, Aug 14

- Mention the location and extent to cavernous sinus
- Its relations and its tributaries
- Mention the reason for pulsating bulge of right eyeball in the above patient
- Classify the cranial dural venous sinuses

SHORT ESSAYS

- Confluence of venous sinuses
- Dural venous sinuses.

Feb 23

Sep 21

- Cavernous sinus - structures related, tributaries and applied aspects

Nov 20, Jan 19,
Feb 17

SHORT NOTES

DECIPHER-I

ANATOMY-I

- Tentorium cerebelli
- Falx Cerebri
- Cisterna magna

Mar 21

Jan 20

Feb 15

MCQs

Old questions (1 mark)

- Components of choroid plexus
- Name two dural folds
- Dural folds

Feb 23

Feb 22

Mar 21

SYSTEMIC EMBRYOLOGY

related to UPPER LIMB, HEAD & NECK, NEUROANATOMY

SHORT ESSAYS

- Describe the development and congenital anomalies of palate
- Describe embryological basis of nerve supply of tongue.
- Development of face
- First brachial arch

Jan 24

Feb 23, Feb 22

Aug 18

Aug 12

SHORT NOTES

- Mesodermal derivatives of first pharyngeal arch
- Development of face
- Development of thyroid gland
- First pharyngeal pouch
- Development of pituitary gland
- Derivatives of pharyngeal pouches
- Cleft palate
- Development and congenital anomalies of face
- First brachial arch
- Development of lips

Jul 24

Jan 24

Jul 23, Aug 15,
Jan 18

Mar 21

Nov 20, Aug 14,
Jan 20

Jan 19

Jan 19

Jul 17

Aug 12

Aug 11

MCQs

single response type questions

- All three germ layers are present in
a) Urachus b) Tympanic membrane c) Cornea d) Heart

Oct 24

Assertion (A) and Reason (R)

- (A): The inferior parathyroid is derived from a more rostral pharyngeal pouch than the superior parathyroid.
(R): The third pharyngeal pouch contributes to the development of the thyroid gland.

Jul 24

- Both A and R are true, and R is the reason for A
- Both A and R are true, and R is not the reason for A
- A is correct but R is incorrect
- A is incorrect but R is correct

Old questions (1 mark)

- Derivatives of third pharyngeal pouch

Jan 24

DECIPHER-I

18	Two derivatives of diencephalon	Jan 24
19	Name two bones derived from 2nd Pharyngeal arch	Nov 23
20	Two derivatives of second pharyngeal arch cartilage.	May 23
21	Derivatives of first pharyngeal pouch	Feb 23, May 22
22	The two processes from which upper lip develops	Feb 22
23	Name the nerve and a muscle of third pharyngeal arch	Aug 21
24	Derivatives of diencephalon	Mar 21
25	Derivatives of second pharyngeal pouch	Mar 21

SYSTEMIC HISTOLOGY

related to UPPER LIMB, HEAD & NECK, NEUROANATOMY

SHORT ESSAYS

1	Explain the microscopic structure of pituitary gland	Nov 23, May 22
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SHORT NOTES

2	Compare and contrast the microscopic features of lymph node and spleen	Oct 24
3	Histology of pituitary gland	Jul 24
4	Microscopic structure of thymus	Jan 24, Feb 22, Nov 20, Feb 15, Aug 16
5	Histology of thyroid	Jan 24, Mar 21, Aug 16
6	Microscopic structure of retina	Nov 23, Feb 22
7	Microscopic structure of cerebellum	Feb 23
8	Microscopic anatomy of pituitary gland.	Sep 21
9	Microscopic structure of cerebrum	Mar 21
10	Histology of palatine tonsil	Aug 19, Aug 12, Aug 11
11	Histology of cerebellum	Nov 20, Aug 15
12	Histology of thyroid gland and parathyroid glands	Feb 17
13	Histology of submandibular salivary gland	Jul 17, Aug 14
14	Spinal ganglion	Feb 14

MCQs

multiple response type questions

15	Which of the following statement/s is/are true about microscopic structure of palatine tonsil 1) Mucous membrane is lined by stratified squamous non-keratinized epithelium 2) Mucous acini are present 3) Hassall's corpuscles are seen in medulla 4) Subcortical sinus is present a) 1,2,3 b) 1,3,4 c) 1,2,4 d) 1,2	Oct 24
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DECIPHER-I

ANATOMY-I

GENERAL QUESTIONS

SHORT NOTES

1	Describe briefly the process of cadaver maintenance in the Anatomy department.	Oct 24
2	Reflect on how to honor and extend gratitude to the cadaver as a Phase 1 MBBS student	Jul 24

MCQs

single response type questions

3	Which of the following fixative is commonly used to preserve a cadaver a) Methanol b) Glycerine c) Toluidine blue d) Formalin	Oct 24
4	The chemical used as a preservative in embalming fluid is: a) Formaldehyde b) Nitric acid c) Glycerin d) Thymol	Jul 24

ANATOMY PAPER-II

QUESTIONS		YEAR
THORAX		
BONES		
SHORT NOTES		
1	Manubrium sterni	Jan 20
MCQs		
Assertion (A) and Reason (R)		
2	A: During sternal puncture a thick needle is inserted into upper part of manubrium sternum. R: Arch of aorta lies behind the lower part of manubrium sternum a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Jul 24
Old questions (1 mark)		
3	Vertebral levels of sternal angle and inferior angle of scapula.	Jan 24
4	Two events occurring at sternal angle.	May 23
5	Two characteristics features of typical thoracic vertebra	Aug 21
DIAPHRAGM		
LONG ESSAYS		
1	A 23year-old pregnant woman who did not go for regular antenatal screening delivered a full-term baby weighing 2kg. Soon after birth the baby was found to be dyspnoeic and vomited continuously after every feed. CT was done for the newborn and it revealed herniation of stomach and intestines into the left side of thoracic cavity. With your knowledge in anatomy, answer the following: a) Name the structure that is defectively developed in this newborn. b) Describe the attachments of this structure. c) Mention the innervation and actions of this structure. d) Mention the openings in this structure and structures passing through them. e) Describe the development of this structure.	Jul 24
SHORT ESSAYS		
2	Thoracic diaphragm	Feb 22
SHORT NOTES		
3	Openings in the abdominal diaphragm	Jan 24
4	Diaphragm.	Sep 21
5	Major openings of diaphragm	Nov 20
MCQs		
multiple response type questions		
6	In addition to aorta, structures passing through the aortic opening of diaphragm are :	Oct 24

DECIPHER-I

- 1) Thoracic duct
3) Azygos vein
a) 1,2,3
- 2) Vagus nerve
4) Hemiazygos vein
b) 1,2,4 c) 1,3 d) 2,4

Old questions (1 mark)

- 7 Structures passing through aortic opening in the diaphragm Jan 24
- 8 Vertebral level of inferior venacaval opening in the diaphragm Feb 23, Aug 21
- 9 Nerve supply of diaphragm Mar 21
- Aug 13

WALL AND RESPIRATION

LONG ESSAYS

- Describe Typical Intercostal Space under the following headings:- Jan 24
- (a) Muscles (b) Blood vessels
- (c) Nerve (d) Applied importance

SHORT ESSAYS

- Describe the course, branches and applied anatomy of typical intercostal nerve Oct 24
- Intercostal vessels Feb 23
- Typical intercostal space- Boundaries, Extent, Contents, Applied anatomy Aug 19, Jan 18

SHORT NOTES

- Briefly explain the intercostal muscles. Jul 24
- Mechanics and types of respiration Aug 21

DRAW AND LABEL

- Typical thoracic spinal nerve Jul 23
- Typical intercostal nerve Aug 21, Aug 14
- Typical intercostal space Jan 20, Nov 20
- Typical spinal nerve Feb 16
- Jul 17

MCQs

Assertion (A) and Reason (R)

- 11 A: Internal thoracic artery can be used for coronary bypass surgery Oct 24
- R: Internal thoracic artery is a branch of ascending aorta
- a) Both A and R are true and R is the reason for A
- b) Both A and R are true and R is not the reason for A
- c) A is correct but R is incorrect
- d) A is incorrect but R is correct

Old questions (1 mark)

- 12 Where does the left superior intercostal vein terminate into. May 23

MEDIASTINUM

LONG ESSAYS

- Describe mediastinum under the following headings Feb 23
- Boundaries
 - Divisions
 - Contents
 - Clinical implications.
- A 52 year old man presented with shortness of breath and coughing up small volumes of blood. Clinical examination revealed multiple dilated veins around the neck. A chest X- ray demonstrated a tumor mass Aug 13

DECIPHER-I

involving the upper part of right lung and elevated right dome of diaphragm. Based on your anatomical knowledge answer the following questions.

- Compression of which structure is responsible for dilated veins in the head and neck
- Mention the extent and relations in the mediastinum
- Briefly describe the other related structures to mediastinal surface of right lung
- Injury to which structure is responsible for elevated diaphragm on the right side
- Briefly describe the broncho-pulmonary segments and its applied importance

DIAGNOSIS: MEDIASTINAL SYNDROME

SHORT ESSAYS

- Arch of aorta Aug 15
- Superior vena cava Aug 13

SHORT NOTES

- Arch of aorta May 22
- Superior mediastinum Jan 20
- Thoracic duct Feb 16, Feb 14
- Superior vena cava Aug 16

DRAW AND LABEL

- 9 Transverse section at the level of T4 vertebra Jul 24, Feb 22, Sep 21, Aug 18, Feb 17
- 10 TS of superior mediastinum showing the arrangement of its contents Feb 23
- 11 Transverse section at sternal angle Feb 15, Aug 12, Aug 11

MCQs

multiple response type questions

- 12 Which of the following statement/s is/are true about thoracic duct Oct 24
- 1) It begins at the lower border of T12 vertebra
- 2) It has a beaded appearance due to the presence of numerous valves
- 3) It is about 25 cm in length 45 cm
- 4) Injury to the thoracic part of the duct may cause chylothorax
- a) 1,3 b) 2, 3, 4
- c) 1,2,3 d) 1,2,4

HEART

LONG ESSAYS

- A 60 year old man who is a smoker, alcoholic and known hypertensive suddenly developed pain in the left side of chest radiating along the medial border of left arm. ECG showed myocardial ischaemia. Coronary angiogram was advised for further evaluation. Based on your knowledge of anatomy answer the following Oct 24

DECIPHER-I

2	a) Describe the origin, course, branches and distribution of coronary arteries b) Add a note on coronary dominance c) Explain the nerve supply of heart	Nov 23
	Describe the Heart under the following headings:- a) External features - Surfaces, borders and grooves and sulcus with their contents b) Describe the blood supply of the heart c) Add a note on the coronary dominance d) Applied anatomy	
3	A 55-year-old male brought to the emergency department with complaints of severe squeezing chest pain, breathing difficulty, sweating and pain along the inner aspect of left upper limb. After taking an electrocardiogram a provisional diagnosis of acute myocardial infarction was made. Apply your knowledge in anatomy and answer the following questions related to coronary artery. • Describe the origin, course, relations and branches of left coronary artery. • Describe the arterial supply of conducting system of heart. • Describe the venous drainage of heart. • Name two arteries supplying the heart most commonly involved in ischemic heart disease.	Feb 22
4	A 50 year old man was brought to medical casualty with complaints of sudden onset of pain in the chest with sweating and increased pulse rate. The chest pain was radiating to inner border of left upper limb. ECG showed evidences of ischemic heart disease. Answer the following. • Mention the origin, course and distribution of the arteries possibly affected in the patient. • Name the veins accompanying the various branches • Why the pain is radiating to the inner border of the left upper limb? • Add a note on surgical intervention possible	Feb 17
CORONARY ARTERY		
SHORT ESSAYS		
5	Coronary arteries	Jul 24, Aug 18, Feb 16, Aug 12, Aug 11
6	Right atrium	May 22
7	Interior of right atrium	Aug 21
8	Right atrium and its development	Jan 20
9	Blood supply of heart	Mar 21
10	Pericardium	Jan 19
SHORT NOTES		
11	Draw a neat labelled diagram of the anterior view of arteries supplying the heart.	Jul 24

ANATOMY-II

DECIPHER-I

12	Pericardium	Jul 23
13	Describe the venous drainage of the heart.	May 23
14	Name tributaries of coronary sinus	Sep 21
15	Anatomical basis of ischaemic heart disease	Aug 21
16	Sinuses of pericardium	Nov 20
17	Coronary sinus	Jan 24, Aug 19, Jan 18, Jul 17, Aug 14, Feb 15, Aug 15
18	Left coronary artery	Aug 13
DRAW AND LABEL		
19	Sterno-costal surface of heart	Sep 21, Mar 21
20	Pericardial sinuses	Jan 18
21	Borders, surfaces and valves of heart	Feb 14
MCQs		
single response type questions		
22	Feature of interior of right atrium is: a) Trabeculae carneae b) Musculi pectinati c) Septomarginal trabeculae d) Moderator band	Jul 24
Assertion (A) and Reason (R)		
23	A: Anterior cardiac veins open into coronary sinus R: Coronary sinus is the largest vein of the heart a) Both A and R are true and R is the reason for A b) Both A and R are true and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Oct 24
24	A: Left ventricular hypertrophy is a feature of Fallot's tetralogy of heart R: Pulmonary stenosis is also a feature of Fallot's tetralogy of heart a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Jul 24
multiple response type questions		
25	Which of the following statement/s is /are true about transverse sinus of pericardium? i. Anteriorly it is bounded by ascending aorta and pulmonary trunk ii. Posteriorly it is bounded by left atrium iii. During cardiac surgery it is used to ligate aorta and pulmonary trunk iv. Develops due to degeneration of dorsal mesocardium a) i, ii, iii b) i, iii, iv c) i, ii, iv d) ii, iii	Jul 24
Old questions (1 mark)		
26	The chamber of heart that forms the apex of heart.	Jan 24
27	Boundaries of transverse sinus of pericardium.	Feb 22
28	Pericardial sinuses	Aug 21
29	Tributaries of coronary sinus of heart	Mar 21

ANATOMY-II

LONG ESSAYS

- 1 A Patient was brought with a history of difficulty in breathing and breathlessness to a clinic. On auscultation creps were noted on both sides of the chest.
- Name the organs involved.
 - Write on external features of the organ and its coverings
 - Write on the differences between right and left side of the organ
 - Write a note on bronchial tree and bronchopulmonary segments

Feb 23

SHORT ESSAYS

- 2 Describe the recesses of pleura and their clinical significance.
- 3 Briefly describe bronchopulmonary segment. Name the bronchopulmonary segments in each lung. Write about their surgical importance.
- 4 Bronchopulmonary segments
- 5 Bronchopulmonary segments of left lung
- 6 Pleura and pleural recesses
- 7 Medial surface of left lung
- 8 Pleura- parts, innervations and applied aspects
- 9 Pleural recesses
- 10 Mediastinal surface of right lung

Jul 24

Jan 24

May 22, Aug

Sep 21

Mar 21

Jan 18

Aug 17

Feb 16, Feb 1

Aug 13

SHORT NOTES

- 11 Parietal pleura
- 12 Pleura
- 13 Left lung
- 14 Mediastinal surface of right lung
- 15 Bronchopulmonary segments

May 23

Feb 22

Mar 21

Aug 15

Jan 19, Aug 1

Jul 17

DRAW AND LABEL

- 16 Mediastinal surface of right lung
- 17 Mediastinal surface of left lung
- 18 Medial surface of right lung

Feb 22, Jan 1

Jan 24, Nov 2

May 22

MCQs

single response type questions

- 19 Which of the following pleura forms the pulmonary ligament
- a) Visceral b) Costal
- c) Diaphragmatic d) Mediastinal

Oct 24

Old questions (1 mark)

- 20 Stages in the development of lung.
- 21 Contents of hilum of left lung
- 22 Structures passing through hilum of left lung

May 23

Mar 21

Mar 21

POSTERIOR MEDIASTINUM

SHORT ESSAYS

- 1 What are the boundaries and Contents of Posterior Mediastinum
- 2 Azygos vein

Nov 23

Nov 20

- 3 Thoracic part of oesophagus
- 4 Cervical and Thoracic part of oesophagus
- 5 Esophagus – vertebral extent, constrictions, relations in thoracic cavity and applied aspects

Aug 11

Feb 14

Aug 14

SHORT NOTES

- 6 Azygos vein
- 7 Boundaries and contents of posterior mediastinum.

Jul 24, Feb 23,

Mar 21, Jul 17

Mar 21

MCQs

- 8 Two tributaries of Azygos vein
- 9 Vein crossing lateral to arch of aorta *left brachiocephalic vein*
- 10 Structures in thorax causing normal oesophageal constrictions.

Nov 23

Feb 23

May 22

ABDOMEN AND PELVIS

ANTERIOR ABDOMINAL WALL AND INGUINAL CANAL

LONG ESSAYS

- 1 A 65-year-old man with chronic history of cough and constipation complained he noticed a gradually increasing swelling in the right groin and feels a dragging sensation at that site. On examination, it was noticed a globular swelling above the pubic tubercle which increased in size on coughing. The patient was diagnosed to have Inguinal hernia
- a) Based on the anatomical knowledge, what are the reasons for swellings in the groin region
- b) What are the boundaries of Inguinal canal
- c) What are the contents of Inguinal canal
- d) What are factors which maintain the Integrity of Inguinal canal
- e) What is Hesselbach's triangle
- 2 Describe the inguinal canal under the following heading:
- Boundaries and contents.
 - Anatomical protective mechanisms for prevention of inguinal hernia.
 - Anatomical basis of two types of inguinal hernia.
 - What are the coverings of inguinal hernia.
- 3 A 70-year old man presented with a swelling in the inguinal region on both the sides. He had cough since two months. The swelling reduces on rest and bulges on coughing.
- Which is the canal through which swelling is appearing.
 - Write about boundaries of the canal and contents of the canal
 - What are the factors which presents the swelling in the normal individuals
 - Write on Hesselbach's triangle

Jan 24

May 23

Feb 23

SHORT ESSAYS

- 4 Explain the formation & contents of rectus sheath
- 5 Rectus sheath-formation, contents & applied anatomy
- 6 Boundaries and contents of inguinal canal
- 7 Inguinal canal - extend, boundaries, contents and applied anatomy

Oct 24

Mar 21, Feb 16

Jan 20

Aug 12

SHORT NOTES

8	Rectus abdominis muscle	Jan 24
9	What is the anatomical basis of umbilical hernia	Nov 23
10	Anatomical basis of inguinal hernia	Feb 23
11	Extent and contents of spermatic cord.	Sep 21
12	Spermatic cord	Feb 16, Aug
13	Rectus sheath	Jan 18, Aug Aug 16

MCQs

case scenario-based questions

14	A 35 year old man noticed a gradually increasing swelling in the right groin. After manually reducing the swelling the surgeon occluded the deep inguinal ring with the thumb and then asked the patient to cough. The swelling was prevented to come out which was suggestive of indirect inguinal hernia. i. The deep inguinal ring is a deficiency in the a) External oblique aponeurosis b) Internal oblique muscle c) Transversalis fascia d) Transversus abdominis ii Which defense mechanism closes the superficial inguinal ring when the external oblique muscle contracts a) Ball valve b) Shutter c) Flap valve d) Slit valve iii. The artery which is just medial to the deep inguinal ring is a) Superficial epigastric b) Superficial circumflex iliac c) Inferior epigastric d) Deep circumflex iliac iv. The medial boundary of Hesselbach's triangle is formed by a) Conjoint tendon b) Inferior epigastric artery c) Medial border of internal oblique d) Lateral border of rectus abdominis v. Which one of the following structures has triple relation (anterior, roof and posterior) to the inguinal canal? a) Internal oblique b) External oblique c) Transversalis fascia d) Conjoint tendon	Oct 24
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Old questions (1 mark)

15	Two branches of lumbar plexus with root value	May 23
16	Name the nerve passing through superficial inguinal ring	Feb 23
17	What forms posterior wall of rectus sheath below the arcuate line	Feb 23
18	Bony attachments of inguinal ligament.	Feb 22
19	What contributes to posterior wall of inguinal canal	Aug 21

SHORT ESSAYS

1 Lesser sac

SHORT NOTES

2	Mention the boundaries of epiploic foramen and its clinical anatomy	Jan 19, Feb 19
3	Epiploic foramen	Jul 24 Jan 24

PERITONEUM

ANATOMY-II

4	Lesser sac	Feb 22, Aug 14, Feb 14, Aug 13
5	Clinical anatomy of pouch of Douglas	Aug 21
6	Sub diaphragmatic recesses	Aug 19
7	Recto uterine pouch with applied aspects	Feb 16

MCQs

Assertion (A) and Reason (R)

8	A: Fluid collection in pouch of Douglas occurs in rupture of tubal pregnancy R: Fluid collected in the pouch of Douglas can be drained through posterior fornix of vagina a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Jul 24
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STOMACH, DUODENUM, SMALL INTESTINE AND LARGE INTESTINE

LONG ESSAYS

1	A 30-year-old man came with history of upper abdominal pain and vomiting. On examination tenderness in the epigastric region was noted. a) Which is the organ involved b) Write about the external features of the organ c) Write about the peritoneal and visceral relations of the organ d) Write on the blood supply of the organ	Jan 24
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STOMACH

SHORT ESSAYS

2	Blood supply and lymphatic drainage of stomach.	Jan 24, May 22
3	Duodenum – parts, relations, openings, blood supply	Jul 23
4	Parts lymphatic drainage development of stomach	Feb 23
5	Stomach – relations, blood supply and lymphatic drainage	Feb 22
6	Gross anatomy, interior, blood supply and development of second part of duodenum	Aug 21
7	Second part of duodenum	Nov 20, Feb 17
8	Duodenum	Jan 19
9	Vermiform appendix	Aug 11

SHORT NOTES

10	Explain the various positions of vermiform appendix and its applied anatomy	Oct 24 Feb 23
11	Lesser omentum	May 22, Jan 19, Jul 17, Aug 16
12	Superior mesenteric artery	Jul 17 Aug 15
13	Transpyloric plane	Aug 14
14	Celiac trunk	Jan 18, Aug 14
15	Lymphatic drainage of stomach	Aug 18
16	Second part of duodenum	
17	Positions of appendix	

DRAW AND LABEL

18	Vermiform appendix	Aug 15
19	Transverse section through the abdomen at the level of epiploic foramen T 12 vertebra	Jul 24
20	Transverse section at the level first lumbar vertebra	Nov 20, Feb 17
21	Transverse section through transpyloric plane	Jan 19
22	Stomach bed	Feb 14
23	Horizontal section at the level of L4 vertebra	Feb 15, Aug 12

MCQs

single response type questions

24	Crypts of Lieberkuhn are present in a) Stomach b) Liver c) Small intestine d) Pancreas	Oct 24
25	All are branches of superior mesenteric artery EXCEPT: a) Right colic b) Middle colic c) Left colic d) Ilio colic	Jul 24

multiple response type questions

26	Which of the following statement/s is /are true about coeliac trunk? i. Arises as a dorsal branch of abdominal aorta ii. Arises at the level of T12-L1 junction iii. Gives rise to left gastric artery, splenic artery and common hepatic artery as its branches iv. Arises at the level of L3 vertebra a) i, ii, iii b) iii, iv c) i, ii, iv d) ii, iii	Jul 24
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Old questions (1 mark)

27	Name two arteries of Coeliac trunk	Nov 23
28	Most common position of vermiform appendix	Aug 21
29	Point located at the junction between upper 2/3 rd and lower 1/3 rd of spino-umbilical line	Mar 21

PANCREAS, LIVER, BILIARY APPARATUS, SPLEEN AND PORTAL VEIN

LONG ESSAYS

1	During an abdominal surgery, the doctor observed a ring of pancreatic tissue surrounding the duodenum and obstructing it. Describe pancreas under a) Gross features b) Relations c) Development d) Microscopic structure	Jul 24
2	Describe the pancreas under following headings: • Situation and parts. • Relations. • Duct system. • Blood supply. • Lymphatic drainage. • Development.	Feb 22
3	A 43-year-old fair lady reported to surgery outpatient department with a history of intense pain in the upper-right side of the abdomen, often accompanied by nausea and vomiting, that steadily increases for approximately 30 minutes to several hours. She also had pain between the shoulder blades or below the right shoulder. She could correlate the attacks often occurred after a particularly fatty meal and almost always happen at night. Other symptoms included abdominal bloating, intolerance of fatty foods, belching, gas, and indigestion. On examination, Murphy's sign was positive liver function tests were mildly abnormal.	Mar 21

Ultrasound revealed presence of stones in gall bladder.

- What is Murphy's sign.
- Gross anatomy of extrahepatic biliary apparatus with neat labelled diagram.
- Arterial supply of extrahepatic biliary apparatus.
- Histology of gall bladder with neat labelled diagram
- Relations of the inferior surface of liver

4	A 55-year-old male presented to the casualty with vomiting of blood. On clinical examination there was an enlarged organ in his right hypochondrium. Also dilated veins were visible in the umbilical region. With your knowledge in anatomy answer the following questions • Name the organ enlarged • What could be the reason for vomiting of blood and dilated veins in umbilical region. • Give the important relations of the organ • Give the blood supply of the organ • Microscopic structure of the organ	Mar 21
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LIVER

5	A 50 years old man came to the casualty with complaints of pain in the abdomen. Diagnostic tests revealed abnormal liver function tests. Answer the following: • extent and parts of liver • relations • peritoneal reflections • blood supply • applied aspects	Nov 20
6	A 65 year old man presented with dilated veins around the umbilicus and vague pain in the epigastric region. He also had a history of bleeding per rectum. Radiological examination revealed an abnormal growth of head and neck of pancreas. Answer the following • Name the structure that would have been compressed by the pancreatic growth • Give formation, course, relations and termination of this structure • Name all possible sites where there could be dilated veins, giving the names of the veins involved with reasons and clinical implications • What are the other structures that are likely to be compressed by the growth • Mention the sources of development of the pancreas	Aug 11

DIAGNOSIS : PORTAL HYPERTENSION

SHORT ESSAYS

7	Describe the development and microscopy of pancreas.	Oct 24
8	Describe the Gall bladder under the following a) Location b) Parts c) Applied anatomy	Nov 23
9	Portosystemic anastomosis with clinical significance	May 23
10	Portocaval anastomosis- sites, vessels involved and applied importance	Feb 23
11	Spleen - surfaces, relations and blood supply	Mar 21
12	Pancreas - parts, relations and blood supply	Jan 20
13	Bile duct	Aug 13

SHORT NOTES

14	Explain the anatomical basis of venous engorgements of anterior abdominal wall and anal canal in portal hypertension	Oct 24
15	Porta hepatis	Jul 23
16	Explain anatomical basis of hematemesis and caput medusae in portal hypertension	Aug 21
17	Portocaval anastomoses	Feb 14
18	Extra hepatic biliary apparatus	Feb 14
DRAW AND LABEL		Jan 18, Jul 17
19	Visceral surface of liver	Aug 15
20	Extra hepatic biliary apparatus	

MCQs

case scenario-based questions

21	A 10 year-old boy was admitted in the hospital with complaints of jaundice, itchy skin, vomiting and pale fatty stools. CT revealed pancreatic tissue encircling the duodenum. i. Which part of the duodenum is involved in this boy a) First b) Second c) Third d) Fourth ii. Jaundice in this boy is due to obstruction of a) Common bile duct b) Major pancreatic duct c) Common hepatic duct d) Cystic duct iii. Tail of the pancreas lies in the: a) Gastrosplenic ligament b) Lienorenal ligament c) Gastrophrenic ligament d) Transverse mesocolon iv. The part of pancreas developing from the ventral pancreatic bud a) Tuber omentale b) Upper part of head of pancreas c) Uncinate process d) Tail of pancreas v. All the following arteries supply the pancreas EXCEPT; a) Superior pancreaticoduodenal artery b) Inferior pancreaticoduodenal artery c) Splenic artery d) Left gastric artery	Jul 24
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Old questions (1 mark)

22	Two true ligaments of liver	Nov 23
23	Name the fissures of liver	Aug 21

SHORT NOTES

1	Inferior vena cava	Jul 17
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MCQs

Old questions (1 mark)

2	Vertebral level of termination of abdominal aorta	May 22
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KIDNEYS AND SUPRARENAL GLANDS

LONG ESSAYS

1	Describe the kidney under following headings • anterior relations • coverings	Feb 23
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- microscopic structure
- anatomical structure

2	A person was brought to casualty with a deep stab injury on the left side of back with complaints of passing frank blood in urine. Answer the following questions • Surface marking of left kidney • Mention its coverings • Relations of left kidney • Arterial supply • Development	Feb 15
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SHORT ESSAYS

3	Right kidney - external features, vertebral extent, coverings, relations and development	Aug 16
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SHORT NOTES

4	Anterior and posterior relations of right kidney	Jul 24
5	Right suprarenal gland	Feb 22
6	Blood supply of supra renal glands	Feb 17
7	Coverings of kidney	Jul 17

DRAW AND LABEL

8	Draw a neat labelled diagram of anterior relations of right and left kidneys	Jan 24
9	Anterior surface of right kidney showing its relations	Feb 23, Feb 22, Sep 21
10	Anterior surface of left kidney showing relations	Mar 21
11	Anterior relations of right and left kidney	Aug 19, Aug 18, Feb 14
12	Posterior surface of left kidney showing relations	Aug 13, Aug 11

MCQs

Old questions (1 mark)

13	Name two nerves related to posterior surface of kidney.	May 22
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PELVIS

SHORT NOTES

1	Branches of internal iliac artery	Feb 23
2	Components of pelvic diaphragm	Feb 23

DRAW AND LABEL

3	Median section of female pelvis	Jan 24, Aug 16
4	Median section of male pelvis	Aug 14

MCQs

multiple response type questions

5	Branches arising from the posterior division of internal iliac artery are: 1) Internal pudendal 2) Iliolumbar 3) Lateral sacral 4) Superior gluteal a) 2,4 b) 1,2,3 c) 1,3 d) 2,3,4	Oct 24
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Old questions (1 mark)

6	Four arteries from anterior division of internal iliac artery	Jan 24
7	Two branches of posterior division of internal iliac artery.	Feb 22

URINARY SYSTEM - URINARY BLADDER AND URETHRA

SHORT ESSAYS

1	Describe the presenting parts, interior, microscopic structure of urinary	Jul 24
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2	bladder.	Aug 15
2	Urinary bladder	Jan 24
SHORT NOTES		
3	Ligaments of urinary bladder	Jul 23
4	Internal trigone of urinary bladder	May 23
5	Clinical and microscopic anatomy of uterine tube.	Sep 21
6	Ureter.	Mar 21, Aug 15
7	Male urethra	Aug 15
8	Trigone of urinary bladder	Jan 20, Aug 16

MALE GENITAL ORGANS

SHORT ESSAYS

1	Describe the internal features, lobes and clinical importance of prostate	Oct 24
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SHORT NOTES

2	Descent of testes	Feb 23
3	Coverings of testis	Aug 21
4	Layers of scrotum	Nov 20
5	Vas deferens	Mar 21

FEMALE GENITAL ORGANS

LONG ESSAYS

1	A 60 years old multiparous woman came to hospital with complaints of mass descending per vaginam. With your knowledge in anatomy answer the following questions. • Name the clinical condition. • Describe the parts, normal position, relations, • Blood supply and lymphatic drainage of uterus. • Describe the supports of uterus.	May 22
2	A 50 years old woman came to the casualty with complaints of pain in the pelvic region. A pelvic scan revealed a mass on the uterus. Answer the following: • Parts of uterus • Relations • Supports • Blood supply • Applied aspects	Aug 19
3	35 year old woman with four living children and history of all vaginal deliveries attended gynaecological out-patient department with complaints of pelvic heaviness, a dragging sensation in the vagina, protrusion of a mass coming down from the vagina and backache. On examination the condition was diagnosed as prolapse of uterus. With your knowledge of anatomy answer the following questions • Anatomical position of non-gravid uterus • Peritoneal supports of uterus • Supports of uterus • Arterial supply of uterus • Lymphatics drainage of uterus	Aug 13

SHORT ESSAYS

4	Describe the supports of uterus	Nov 23
5	Supports of uterus and its applied anatomy	Sep 21, Feb 14

SHORT NOTES

DECIPHER-I

6	Supports of uterus	Jul 24
7	True ligaments of uterus	Jul 23, Feb 15
8	Broad ligament of uterus	Feb 23
9	Fallopian tube	Mar 21

MCQs

multiple response type questions

10	Which of the following statement/s is /are true about cervical canal? i. Presents with arbor-vitae appearance in its interior ii. Extends from internal os to external os iii. In multiparous women the external os is vertical with right and left lips iv. Endocervix is lined by columnar epithelium a) i, ii, iii b) i, iii, iv c) i, ii, iv d) ii, iii	Jul 24
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Old questions (1 mark)

11	What is the ante flexion angle of uterus	Jan 24
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PERINEUM

SHORT ESSAYS

1	Describe the boundaries and contents of perineal pouches	Oct 24
2	Describe the boundaries, contents and applied anatomy of ischio rectal fossa	Jul 24
3	Boundaries and contents of ischio rectal fossa	Jul 24
4	Perineal pouches	Jan 24
5	Describe ischio rectal fossa with clinical significance.	May 23
6	Ischio rectal fossa.	Feb 22
7	With the help of a neat diagram, describe ischio- rectal fossa . Give its clinical importance	Aug 21 , Jul 17 , Aug 14

SHORT NOTES

8	Perineal membrane in males	Jan 24
9	Superficial perineal pouch	Nov 23, Feb 22 , Jan 20
10	Ischio rectal fossa.	Feb 23
11	Boundaries and contents of superficial perineal pouch.	May 22
12	Urogenital diaphragm	Mar 21 , Jan 19
13	Structures piercing perineal membrane in females	Aug 19
14	Perineal body	Jan 18
15	Pudental canal	Feb 14
16	Deep perineal pouch and its contents	Aug 14 , Aug 12

MCQs

Assertion (A) and Reason (R)

17	A: Pudental nerve is related to the dorsal surface of ischial spine R: Pudental nerve block is given during episiotomy suturing after vaginal delivery a) Both A and R are true and R is the reason for A b) Both A and R are true and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Oct 24
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Old questions (1 mark)

- | | | |
|----|---|--------|
| 18 | Contents of Alcock's canal | Nov 23 |
| 19 | Two muscles present in superficial perineal pouch | May 23 |

RECTUM AND ANAL CANAL

LONG ESSAYS

- | | | |
|---|--|--------|
| 1 | Describe the Anal canal under the following Headings | Nov 23 |
|---|--|--------|

- Extent of the Canal
- Interior features of the Anal canal
- Blood and Nerve supply of the Anal canal
- Anatomical basis of haemorrhoids

- | | | |
|---|---|--------|
| 2 | A middle aged man visited the surgical OPD with history of bleeding per anum since three months. On clinical examination, he was found to have internal haemorrhoids. From your knowledge of anatomy describe the anal canal under the following headings | Aug 18 |
|---|---|--------|
- Mucosal anatomy
 - Sphincteric muscles
 - Blood supply
 - Clinical aspects

- | | | |
|---|--|--------|
| 3 | A 52 year old man with progressive weight loss complains of pain and bleeding near the anal orifice. His condition is diagnosed as carcinoma of anal canal. At this stage of the disease, the neoplasm is located entirely below the pectinate line. Based on your anatomical knowledge, answer the following. | Feb 17 |
|---|--|--------|
- To which group of lymph nodes, cancer from this part of anal canal is likely to spread?
 - Name the nerve carrying pain sensation from this part of the anal canal.
 - Describe briefly the interior of anal canal with the help of a diagram
 - How the development, arterial supply, venous drainage and the nature of epithelial lining of the anal canal differ from each other above and below pectinate line?
 - What is the clinical significance of knowing the venous drainage of the anal canal?

SHORT ESSAYS

- | | | |
|---|------------|--------|
| 4 | Anal canal | Aug 12 |
|---|------------|--------|

SHORT NOTES

- | | | |
|---|------------------------|--------|
| 5 | Interior of anal canal | Feb 16 |
|---|------------------------|--------|

MCQs

multiple response type questions

- | | | |
|---|---|--------|
| 6 | Which of the following statement/s is/are true about rectum | Oct 24 |
|---|---|--------|
- The rectosigmoid junction corresponds to third sacral vertebra
 - Fascia of Waldeyer separates the rectum from the urinary bladder
 - The inferior rectal valve is the largest and most constant
 - The puborectalis sling maintains the angulation at the anorectal junction

a) 2,3,4

b) 1,4

c) 1,2,3

d) 3, 4

- | | | |
|---|---|--------|
| 7 | Which of the following statement/s is /are true about the pectinate line of anal canal? | Jul 24 |
|---|---|--------|
- Represents embryologically two different sources of development
 - Below the line the anal canal is supplied by inferior rectal vessels
 - Lymphatics from the anal canal inferior to the line drain into internal iliac nodes
 - Part of the anal canal superior to the line is insensitive to pain

- a) i, ii, iii b) i, iii, iv c) i, ii, iv d) i, ii

LOWER LIMB

BONES

SHORT NOTES

- | | | |
|---|---------------|--------|
| 1 | Head of femur | Jul 17 |
| 2 | Linea aspera | Aug 12 |

MCQs

single response type questions

- | | | |
|---|--|--------|
| 3 | Which one of the following bones is devoid of muscular attachments | Oct 24 |
|---|--|--------|
- Talus
 - Cuboid
 - Calcaneum
 - Navicular

Old questions (1 mark)

- | | | |
|---|--|--------|
| 4 | Two structures attached to Linea Aspera. | Jan 24 |
|---|--|--------|

GLUTEAL REGION

LONG ESSAYS

- | | | |
|---|--|----------|
| 1 | A 15-year-old boy came with Altered Gait to the OPD after intramuscular Injection in the right buttock. On examination, he was found to be having Foot drop on the right side. | Nov 23 ✓ |
|---|--|----------|
- Based on the above case what is the Anatomical reason for the Boy's condition
 - Describe the origin, insertion and Nerve supply of Gluteus maximus
 - What are structures under the cover of Gluteus maximus
 - Anatomical basis of Trendelenburg sign

SCIATIC NERVE INJURY

- | | | |
|---|---|--------|
| 2 | A 12 year old boy following an inadvertent intra-muscular injection in the gluteal region developed certain neurological deficits including difficulty to dorsiflex the foot. | Aug 11 |
|---|---|--------|
- Answer the following questions
- Mention structures undercover of gluteus maximus
 - Name the structure which is affected in this case. Give its origin, course and distribution in thigh
 - Give the cutaneous innervations of lower limb below knee
 - Name the muscles responsible for dorsiflexion and eversion of foot

SHORT NOTES

- | | | |
|---|---|----------------|
| 3 | Piriformis | Jul 23 |
| 4 | Gluteus maximus | Feb 22, Aug 16 |
| 5 | Structures under cover of gluteus maximus | Aug 15 ✓ |

DECIPHER-I

ANATOMY-II
Aug 15, Aug 13,
Aug 11

6 Greater sciatic notch

MCQs

Assertion (A) and Reason (R)

- 7 A: Superolateral quadrant of gluteal region is a safe site for intramuscular injection
R: Injection into the medial quadrants will endanger important nerves and vessels
a) Both A and R are true and R is the reason for A
b) Both A and R are true and R is not the reason for A
c) A is correct but R is incorrect
d) A is incorrect but R is correct

Oct 24

FRONT OF THIGH

LONG ESSAYS

- 1 Describe the boundaries, contents and applied anatomy of femoral triangle.

Oct 24 ✓

SHORT ESSAYS

- 2 Inguinal lymph nodes
3 Femoral triangle
4 Femoral canal and its applied anatomy
5 Femoral artery
6 Adductor canal- boundaries and contents
7 Femoral sheath and applied aspects

Jul 23

Feb 23, Sep 21

Mar 21

Feb 16, Aug 16

Jul 17, Feb 15

Feb 17

SHORT NOTES

- 8 Describe the anatomical basis of femoral hernia.
9 Adductor canal
10 Femoral sheath
11 Superficial inguinal lymph nodes
12 Femoral artery

Jul 24

Jan 24

Feb 23

Jan 19

Aug 14

DRAW AND LABEL

- 13 Transverse section of right mid-thigh
14 Cross section at middle of thigh
15 Femoral triangle
16 Transverse section of thigh at the level of adductor canal

Jul 24

Jan 24

Aug 19, Feb 15,

Aug 14, Aug 12

Jan 19

MCQs

multiple response type questions

- 17 Muscles inserted into the iliotibial tract are
1) Biceps femoris 2) Tensor fascia lata
3) Gluteus medius 4) Gluteus maximus
a) 1,3 b) 2,3,4 c) 2,4 d) 1,2,3

Oct 24

Old questions (1 mark)

- 18 Two superficial branches of femoral artery in the femoral triangle
19 Nerve supply of Adductor Magnus Muscle.
20 Posterior wall of femoral sheath.

Nov 23

May 23

May 23

DECIPHER-I

ANATOMY-II

21 Contents of femoral canal

BACK OF THIGH

Aug 21

SHORT NOTES

- 1 Hamstring muscles

Aug 13

MCQs

Assertion (A) and Reason (R)

- 2 A: The long head of biceps femoris is grouped under hamstrings.
R: Long head of Biceps femoris originates from ischial tuberosity, inserted into fibula and is innervated by tibial component of sciatic nerve.
a) Both A and R are true, and R is the reason for A
b) Both A and R are true, and R is not the reason for A
c) A is correct but R is incorrect
d) A is incorrect but R is correct

Jul 24

POPLITEAL FOSSA

SHORT ESSAYS

- 1 Popliteal fossa

May 23

MCQs

Old questions (1 mark)

- 2 Superomedial boundary of popliteal fossa
3 Structures in the floor of popliteal fossa

Feb 23

Mar 21

LEG

SHORT ESSAYS

- 1 Soleus muscle
2 Extensor retinaculum of lower limb

Feb 23

Sep 21

SHORT NOTES

- 3 Structures passing beneath the extensor retinaculum of the foot

Nov 23

DRAW AND LABEL

- 4 Cross section at middle of leg.
5 Transverse section through middle of leg

May 23

Jan 20, Aug 18

MCQs

Old questions (1 mark)

- 6 Muscles that form Tendo achilles.
7 Two muscles that produce plantar flexion
8 Nerve passing underneath the flexor retinaculum of foot.
9 Nerve and artery passing deep to inferior extensor retinaculum of foot.

Jan 24

Nov 23

May 22

Feb 22

FOOT

LONG ESSAYS

- 1 A 20-year-old male had applied for selection into defence academy in India. His application was rejected during physical examination on the grounds of Bilateral Flat Foot.
a) What is the anatomical basis of flat foot.
b) Classify arches of foot.
c) What are the components and features of each type of arches of foot.
d) What are the factors that maintain the arches of foot

Jan 24 ✓

DECIPHER-I

2	Describe the arches of foot under following headings: • Classification • Formation • Factors responsible for maintenance of arches • Functions	Feb 22 ✓
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SHORT ESSAYS

3	Describe the longitudinal arches of foot and their clinical anatomy.	Jul 24
4	Arches of foot	May 22

SHORT NOTES

5	Explain the course, branches and clinical importance of dorsalis pedis artery	Oct 24
6	Medial longitudinal arch of foot	Jul 24, Feb 17, Jul 17
7	Plantar aponeurosis	Feb 23 ✓
8	Dorsalis pedis artery	Mar 21, Aug 19
9	Longitudinal arches foot	Aug 12
10	Inversion and eversion	Aug 15, Aug 14
DRAW AND LABEL		Aug 13
11	Longitudinal arches foot	

NERVES

LONG ESSAYS

1	Describe sciatic nerve under following headings: root value, course and relations, branches and clinical anatomy.	Jul 24 ✓
2	60 year old lady was brought to the casualty following a history of fall at her residence. On clinical examination, the anatomical orientation of her right lower limb was disturbed. X-ray showed posterior dislocation of her right hip joint. With your anatomical knowledge answer the following questions. • Name the nerve which can be injured in this patient. • Give the root value of the nerve. • Name one clinical procedure that can cause injury to this nerve. • Describe the course of this nerve. • Name the branches of this nerve and the muscles supplied by those branches.	Aug 21

DIAGNOSIS : SCIATIC NERVE

3	A middle aged male patient complained of low back pain radiating to leg on right side and numbness and weakness in various parts of leg and foot. The condition was diagnosed as sciatica. With your knowledge of anatomy, answer the following questions • Describe the root value, formation and course of sciatic nerve • Name the functional groups of muscles innervated by this nerve and its branches at various levels. • Name the cutaneous branches of this nerve at various levels along its course	Nov 20
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SHORT ESSAYS

4	Femoral nerve	Jan 24
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DECIPHER-II

ANATOMY-II

5	Sciatic nerve	Jan 20
6	Common peroneal nerve	Aug 16 ✓
7	Cutaneous innervation of lower limb below knee	Aug 12

SHORT NOTES

8	Obturator nerve	Jul 23
9	Anatomical basics of foot drop	Feb 23 ✓
10	Common peroneal nerve	Sep 21
11	Sciatic nerve	Aug 18, Aug 14
12	Saphenous nerve	Feb 17
13	Cutaneous innervation of lower limb below knee	Aug 11

MCQs

Assertion (A) and Reason (R)

14	A: Injury to tibial nerve results in foot drop R: Tibial nerve is a branch of sciatic nerve a) Both A and R are true and R is the reason for A b) Both A and R are true and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Oct 24
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Old questions (1 mark)

15	Muscles supplied by superficial peroneal nerve.	Feb 22
16	Root value of sciatic nerve	Mar 21
17	Nerve involved in foot drop	Feb 14

JOINTS

LONG ESSAYS

1	There was a posterior dislocation of hip joint in a 30-year old man injuring his sciatic nerve. Answer the following regarding hip joint. a) Name the bones articulating b) Ligaments c) Movements & muscles causing them d) Nerve supply e) Applied aspects	Jul 24 ✓
2	Describe the intracapsular structures of knee joint. Explain the clinical importance of any two of them.	May 22 ✓
3	An 18-year-old boy was hit down by car while walking on the road and sustained injury to his right knee joint. He visited to orthopaedic clinic with complaints of pain, swelling and while walking his right knee is giving out (instability). On examination, soft tissue swelling and tenderness present around right knee joint. Lachman test was performed and shows abnormal forward & backward movement of right tibia. With your anatomical knowledge, answer the following questions related to knee joint. • Describe the articular surfaces of knee joint. • Describe the ligaments of knee joint. • Name the structure(s) that maintain the anteroposterior stability of knee joint. • What is locking and unlocking of knee joint. • Nerves that supply knee joint	Mar 21

DECIPHER-I

4	35 years male patient was brought to the casualty with a swollen right knee and a history of a fall during mountain climbing. There was severe pain and restricted mobility at the joint. Answer the following. • Describe the attachments and relations of ligaments of this joint • What are the movements at this joint and which muscles are involved?	Jan 18 ✓
5	A 50 year old man came to the casualty with complaint of pain in the hip joint. Answer the following questions • Bones forming hip joint • Movements and muscles causing them • Blood supply • Ligaments • Nerve supply • Applied aspects	Aug 18 ✓
6	A 30-years old man was brought to the casualty following a road traffic accident. On examination, his right lower limb was shortened, flexed and internally rotated. X-ray of his right hip showed posterior displacement of head of femur. Following surgical correction of dislocation of hip, the patient was not able to dorsiflex his right foot. Based on your knowledge in anatomy answer the following questions. • Injury to which nerve in posterior dislocation of hip, can produce inability to dorsiflex the foot. • Briefly describe the articular surfaces, capsule and ligaments, blood supply and nerve supply of the hip joint. • Name the muscles acting at the hip joint and mention the appropriate movements produced by them • Mention the anatomical features render this joint prone to dislocation.	Feb 14
7	A footballer is suffering from sustained injury to his right knee while kicking. His leg got forcefully abducted in a slightly flexed position. • Which is the likely meniscus has injured in this case. • Why this meniscus is more prone to injury as compared to the other one. • Enumerate the other intra capsular structures of the knee joint • Briefly describe the process of locking and unlocking at the knee joint	Aug 15

SHORT ESSAYS

8	Describe the cruciate ligaments and menisci of knee joint and their clinical importance	Oct 24
9	Ligaments of knee joint	Feb 23, Feb 22, Jan 19
10	Movements at knee joint	Aug 21
11	Hip joint	Aug 14, Feb 14, Aug 13

SHORT NOTES

12	Describe the factors stabilizing the ankle joint.	Jul 24
13	Ankle joint	Feb 22
14	Lateral rotators of hip joint.	Feb 22
15	Deltoid ligament of ankle	Mar 21
16	Ligamentum patella	Jan 20
17	Tibial collateral ligament	Jul 17

DECIPHER-I

18	Medial collateral ligament of knee joint	ANATOMY-II
19	Cruciate ligaments	Aug 11
20	Intra articular structures of knee joint	Feb 14, Aug 14
21	Locking and unlocking	Aug 15
22	Structures surrounding hip joint	Aug 15
23	Transverse section through knee joint	Feb 23, Mar 21
		Jan 24, Nov 20, Aug 16

MCQs

Assertion (A) and Reason (R)

24	A: Lateral meniscus of knee is seldom injured in football players R: Fibular collateral ligament is not attached to the lateral meniscus a) Both A and R are true, and R is the reason for A b) Both A and R are true, and R is not the reason for A c) A is correct but R is incorrect d) A is incorrect but R is correct	Jul 24
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Old questions (1 mark)

25	two muscles of intracapsular origin	Aug 19
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VEINS

LONG ESSAYS

1	A 50 year old traffic police man came to a surgeon with a complaint of swollen vessels in the leg which appears prominent on standing for long periods. On examination it was found to be superficial veins of lower limb involved • What is the name of this condition and which are the vessels involved. • What is the test performed in this condition • Describe the origin course and termination of these vessels • What is the communication between superficial and deep veins and their role in venous drainage of lower limb	Mar 21
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DIAGNOSIS: VARICOSE VEIN

2	A 40 years old shopkeeper whose job requires standing up to 15 hours per day developed abnormally swollen (Varicose) veins in left leg leading to non-healing ulcers above left medial malleolus. The condition was diagnosed by a surgeon as dilated and incompetent saphenous vein and the associated incompetent perforators. Based on your basic knowledge of anatomy answer the following questions • Describe the course and relations of great saphenous vein • Name the tributaries of great saphenous vein • What are perforating veins and what is its function. • Describe the various perforating veins in lower limb. • Name the tests performed for observing competence of superficial veins	Aug 19
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SHORT ESSAYS

3	Formation, course, tributaries and termination of great saphenous vein. Give its applied importance.	Jan 24
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4 Venous drainage of lower limb

Feb 14

SHORT NOTES

5 Anatomical basis of dilated veins of lower limb.

May 22

6 Great saphenous vein

Jan 20, Jan 18,
Aug 12**MCQs****multiple response type questions**

7 True about great saphenous vein is/are

Jul 24

i. Superficial vein of lower limb

ii. Terminates into femoral vein

iii. Receives deep external pudendal vein

iv. Passes in front of the lateral malleolus

a) i, ii b) i, ii, iii c) i, iv d) i, iii

SYSTEMIC EMBRYOLOGY

related to THORAX, ABDOMEN & PELVIS, LOWER LIMB

LONG ESSAYS

1 A 2-month old male child was brought to the hospital since the mother noticed the left scrotum of the boy was empty. On examination it was noticed that the right testis was in the scrotum. A swelling of 1.5 cm diameter was noted in the left inguinal region. On ultrasound examination it was confirmed that the left testis was in inguinal canal.

Aug 21

- Mention any two conditions resulting in empty scrotum in newborn.
- Describe the development and descent of testis.
- Coverings of testis.
- Microscopic structure of testis

SHORT ESSAYS

2 Describe the development of kidney and its associated anomalies.

Jul 24

3 Midgut – Derivatives, Rotation and Associated anomalies

Feb 22

SHORT NOTES

4 Development of interatrial septum

Jan 24, Aug 19

5 Para mesonephric duct

Feb 22

6 Formation and fate of the para mesonephric duct

Jan 20, Jan 18

7 Development of pancreas

Aug 19

8 Inter ventricular septum

Aug 18, Feb 16

9 List the derivatives of mesonephric duct in males

Feb 17

10 Right atrial development

Aug 16

11 Meckel's diverticulum

Aug 15

12 Development of portal vein

Jul 15

13 Development of lungs

Feb 14

14 Developmental descent of testis

Feb 14, Aug 13

15 Derivatives of midgut

Aug 12

16 Derivatives of pre-arterial segment of midgut loop

Aug 12

17 Development of anal canal

Aug 11, Feb 15,

MCQs**single response type questions**

Feb 17

18 All of the following are derived from hindgut EXCEPT

- a) Rectum
b) Appendix
c) Descending colon
d) Sigmoid colon

Oct 24

19 Ductus deferens develops from

- a) Mesonephric duct
b) Paramesonephric duct
c) Mullerian duct
d) Gartner's duct

Jul 24

Assertion (A) and Reason (R)

20 A: Left ventricular hypertrophy is a feature of Fallot's tetralogy of heart
R: Pulmonary stenosis is also a feature of Fallot's tetralogy of heart

Jul 24

- a) Both A and R are true, and R is the reason for A
b) Both A and R are true, and R is not the reason for A
c) A is correct but R is incorrect
d) A is incorrect but R is correct

Old questions (1 mark)

21 Developmental sources of interatrial septum.

Nov 23, May 22,
Feb 22

22 Structure that develops from left horn of sinus venosus

Feb 23

23 Structure hooking ligamentum arteriosum

May 22

24 Developmental source of ductus deferens

May 22

25 Developmental sources of kidney.

Feb 22

26 Sources of development of arch of aorta

Mar 21, Aug 11

27 Hindgut derivatives

Mar 21

28 Developmental sources of diaphragm

Mar 21

SYSTEMIC HISTOLOGY

related to THORAX, ABDOMEN & PELVIS, LOWER LIMB

SHORT ESSAYS

1 Describe the microscopic features of fundus and pyloric part of stomach.

Jul 24

2 Explain the microscopic structure of small intestine

Jan 24

3 Microscopic structure of stomach with neat labelled diagram.

May 23

4 Uterus - Microscopic anatomy and changes in different phases of uterine cycle

Mar 21

5 Histology of ovary

Aug 18

6 Histology of pancreas

Feb 14, Aug 13

SHORT NOTES

7 Describe the microscopic structure of liver

Oct 24

8 Histology of kidney

Jan 24

9 Microscopic structure of spleen

Nov 23, Aug 21

DECIPHER-I

10	Histology of appendix	Jul 23
11	Histology of ureter	Feb 23
12	Histology of pancreas	Feb 22, Jan 20
13	Microscopic structure of prostate	Aug 21, Feb 23
14	Microscopic structure of supra renal gland	Jan 20
15	Histology of hepatic and portal lobule	Aug 18

MCQs

single response type questions

16	The lining epithelium of uterine endometrium is a) Simple squamous b) Simple cuboidal c) Simple columnar d) Pseudostratified columnar	Oct 24
17	Corpora amylacea is a microscopic feature seen in: a) Testis b) Prostate gland c) Epididymis d) Seminal vesicle	Jul 24

Old questions (1 mark)

18	Two types of cells present in main gastric glands	Aug 21
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GENERAL QUESTIONS

SHORT NOTES

1	Describe the importance of communication skill in medical profession	Oct 24
2	Reflect on the statement "Respect for Cadaver in the dissection hall".	Jul 24

MCQs

single response type questions

3	Which of the following is used as an antifungal agent in the embalming fluid a) Thymol crystals b) Isopropyl alcohol c) Glycerine d) Eosin	Jul 24
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DECIPHER-I

PHYSIOLOGY

PAPER-I:
HAEMATOLOGY, CARDIO VASCULAR SYSTEM, RESPIRATORY SYSTEM, GASTROINTESTINAL SYSTEM, RENAL SYSTEM, SKIN AND TEMPERATURE REGULATION, ENVIRONMENTAL PHYSIOLOGY

PAPER-II:
GENERAL PHYSIOLOGY, ENDOCRINOLOGY, REPRODUCTIVE SYSTEM, CENTRAL NERVOUS SYSTEM, SPECIAL SENSES, MUSCLE AND NERVE PHYSIOLOGY, GROWTH AND DEVELOPMENT

* The topics to different paper are generally evaluated under those sections. However, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

QUESTION PAPER PATTERN

Total duration- 3 hrs			
Question pattern	No of questions	Max mark	Total marks
Multiple choice questions(MCQ)	20	1 mark each	20
Essay questions	2	10 marks each	20
Short essay questions	6	6 marks each	36
Short answers	6	4 marks each	24
Total marks			100 marks

Pattern for multiple choice questions

Sl.no	Type of questions	No of MCQ	Marks
1)	Single response type	5	5x1=5 marks
2)	Multiple response type	5	5x1=5 marks
3)	Assertion reason type	5	5x1=5 marks
4)	Clinical scenario based MCQs	1 scenario with 5 questions	5x1=5 marks

PHYSIOLOGY PAPER-I

QUESTIONS		YEAR
HEMATOLOGY		
RBC		
LONG ESSAYS		
1	A 30 years old woman comes to the hospital with complaints of fatigue for many months. On physical examination she has pale conjunctiva and spooning of nails. Her hemoglobin is Bgm% PCV is 20% and MCV is 80 fL. Stools are negative for occult blood. • Name the clinical condition. • Describe the blood picture. • What other investigations would you like to do in this condition. • What are the dietary options for her betterment	Feb 23
2	A 35- year old female had come to a medical outpatient department with complaints of weakness, giddiness and loss of appetite. On examination she was pale On investigation RBC count :3.5 millions/mm ³ , Hb:9gm%. Peripheral smear showed microcytes with hypochromia • Identify the condition • Discuss the physiological basis for the above condition and its management • Discuss the stages of erythropoiesis • Describe the various factors which regulate erythropoiesis	May 22
3	A 12 years old girl child complains of lethargy and fatigability for the last three months. Physical examination revealed pallor. Routine blood investigation showed Hb -8 gm% and peripheral smear revealed microcytic hypochromic RBCs. Answer the following: • Identify the clinical condition and what is the cause • Define anemia. • Classify anemia based on etiology. • Enumerate stages of erythropoiesis and discuss the factors regulating	Jan 20
DIAGNOSIS : IRON DEFICIENCY ANEMIA		
4	A 30 years old woman visits a clinic with the complaints of difficulty in breathing and fatigue. She has menorrhagia for the past 3 months. Her Hb level is 6 gm% , PCV 20% and the reticulocyte count is 8%. Answer the following: • Name the clinical condition • Describe the blood picture in this condition • Classify anemia based on etiology • Describe iron deficiency anemia	Aug 16
DIAGNOSIS : IRON DEFICIENCY ANEMIA		
SHORT ESSAYS		
5	Describe the steps of erythropoiesis using neat, labelled diagrams. List the factors regulating it.	Jan 24

DECIPHER-I		PHYSIOLOGY-I
✓ 6	Describe the stages of erythropoiesis with the help of diagrams. Describe the factors regulating it. Add a note on polycythemia.	Feb 22
✓ 7	Describe the different stages and factors influencing and regulating erythropoiesis	Sep 21
✓ 8	Explain the factors regulating erythropoiesis	Nov 20
SHORT ANSWERS		
✓ 9	Describe the factors regulating erythropoiesis	Oct 24
✓ 10	List the classification of Anemia based on the cause.	Jan 24
✓ 11	Physiological basis for anemia in chronic renal failure.	Jan 24
✓ 12	Polycythemia in High altitude areas. Why?	Jan 24
✓ 13	ESR can be low in spherocytosis - why.	Nov 23
✓ 14	Draw and label : steps of erythropoiesis	Feb 23
✓ 15	Iron deficiency anemia	Mar 21
✓ 16	Polycythemia at high altitude ,Why?	Mar 21 , Jan 20
✓ 17	Pernicious anemia	Jan 18
✓ 18	Megaloblast in vitamin B12 deficiency anemia ,Why?	Jul 17 , Sep 11
✓ 19	Gastrectomy produces pernicious anemia,Why?	Aug 18, Aug 16
✓ 20	Maturation factors	Feb 15 , Aug 14
✓ 21	Fetal haemoglobin	Aug 14
✓ 22	Hemophilia	Aug 13
✓ 23	Physiological jaundice	Feb 13
✓ 24	Sickle cell anemia	Feb 13
✓ 25	Reticulocytosis	Mar 12

MCQS

Clinical scenario based

26	A 28-year-old female patient, Mrs. Radha, visits her Physician with complaints of extreme tiredness over the past six months. She has become breathless on exertion in the past few days. Her feet have become numb, and she has started to become unsteady. On examination, her conjunctiva is pale, and her pulse rate is 114 beats/ minute. She has sensory loss in a glove and stocking distribution with a severe loss of joint position sense. Answer the following questions based on this scenario. i. The Physician would suggest an assay of which dietary constituent to confirm his diagnosis. a) Iron b) Ferritin c) Vitamin B12 d) Vitamin C ii. Which of the following is TRUE regarding the above clinical condition a) The mean corpuscular volume is less than 80 fl b) Failure of final maturation of RBC is the primary pathology here c) It can be treated by replacement of iron d) RBCs have different shapes and size iii. The basis of breathlessness on exertion in this patient is a) Tissue hypoxia as oxygen supply cannot meet the excessive oxygen demand b) Decreased cardiac output c) Increased cardiac workload	Jul 24
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DECIPHER-I		PHYSIOLOGY-I
d) Increased stimulation of respiratory centers	iv. Which of the following RBC indices will be the most reliable indicator for diagnosing hematological disorders a) Mean Corpuscular Volume b) Mean Corpuscular Hemoglobin c) Mean Corpuscular Hemoglobin concentration d) Color Index	
v. Which of the hemodynamic parameters is known to INCREASE in the above clinical condition a) Cardiac output b) Blood viscosity c) Peripheral resistance d) Oxygen carrying capacity		
Single response type		
27	Pernicious anemia is caused due to deficiency of a) Vitamin B6 b) Vitamin B12 c) Vitamin B2 d) Vitamin B1	Oct 24
28	Chloride ions are exchanged with one of the following ions during the chloride shift. a) Hydrogen b) Calcium c) Sodium d) Bicarbonate	Jul 24
old question(1 mark)		
29	Strict vegetarians can be prone for -----type of anemia	Jan 24
30	Lymphoid organ that functions as reservoir of red blood cells	Feb 23
31	Gastrectomy produces pernicious anemia	Feb 23
32	Nutritional anaemia seen in Vitamin B12 deficiency is...	Aug 21
WBC		
LONG ESSAYS		
1	A 25 year old male nurse reported to the medicine department complaining of <u>chronic cough</u> with <u>sputum</u> and <u>fever</u> with <u>night sweats</u> for the past 6 months, which is not relieved with routine antibiotic therapy. His lab report showed: Total WBC-13000/cumm ³ , N- 32%, L-55%, M-8%, E-4%, B-1%, ESR-50. Chest x-rays showed cavities a) Name the most probable clinical condition b) Comment on the ESR of this patient and describe the physiological basis for that c) Describe cell mediated immunity d) List the functions of lymph	Jul 24 TB
2	A two-year-old baby girl was admitted presenting with pallor, recurrent <u>fever episodes</u> , <u>weakness</u> and <u>fatigue</u> since 4 months. On examination, the spleen was found to be enlarged. The peripheral blood picture revealed normocytic normochromic RBCs, however, the WBCs showed a significant number of blast cells. Blood tests also revealed that platelets were reduced and there was thrombocytopenia. • What is the patient suffering from • What is the significance of seeing blast cells in a peripheral blood smear • Explain the steps of leucopoiesis • Why does thrombocytopenia occur in this condition	Jan 24 Luke

DECIPHER-I			PHYSIOLOGY
SHORT ESSAYS			
3	Classify white blood cells and explain their morphology and functions. Add a note on leukaemia.	May 23	
4	Explain T lymphocyte	Feb 23	
5	Define immunity and classify it. Explain the mechanism of cell-mediated immunity. Add a note on natural killer cells.	Feb 22	
6	Describe the role of T-lymphocytes in immune mechanisms	Aug 21	
7	Reticulo-endothelial system	Aug 19	
8	Functions of neutrophil	Aug 21	
SHORT ANSWERS			
9	Explain the composition and functions of lymph.	May 23	
10	Describe the structure and functions of neutrophil	Mar 21	
11	Functions of reticulo-endothelial system	Mar 21	
12	Neutrophil	Jan 20	
13	Neutrophilia in acute bacterial infections. Why?	Aug 19	
14	HIV infection reduces immunity. Why?	Aug 18	
15	T-lymphocyte	Jan 18, Aug	
16	Leucocytosis	Aug 14	
17	Protective effect of vaccination	Feb 14	
18	Plasma cell	Feb 13	
19	Role of lymphocytes in immune functions	Sep 11	
MCQS			
Multiple response type			
20	Functions of eosinophil include 1) Anti allergic 2) Clotting 3) Anti parasitic 4) mild phagocytosis a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	Oct 24	
single response type			
21	The major regulator of immune system in humans a) Natural killer cells b) Cytotoxic T cells c) Helper T cells d) Suppressor T cells	Oct 24	
old question(1 mark)			
22	Cell mediated immunity is mediated by blood cells.	Nov 23	
23	Perforins are secreted by cells	May 22	
24	The cell that processes and presents antigens to lymphocytes is	Aug 21	
LONG ESSAYS			PLATELETS
1	A forty-five-year-old female complains of fatigue and generalized weakness. She has observed the appearance of small, red dots on her skin and gums two days back. When she was injured during her domestic work, wound bled for a prolonged period. On examination and investigations, her platelet count was 30,000/cu mm and her clotting time was prolonged. She has no previous history of taking any medications, nor did she suffer from any viral infections recently.	Feb 22	

DECIPHER-I			PHYSIOLOGY-I
- What is she suffering from - What is the normal platelet count and where they are produced - Explain the role of Platelets in clotting mechanism - What are the causes of platelet deficiency suffer from any viral infection recently.			
DIAGNOSIS: THROMBOCYTOPENIC PURPURA			
SHORT ESSAYS			
2	Describe the structure morphology, properties and functions of platelets	Mar 21, Mar 12	
SHORT ANSWERS			
3	Functions of platelets	Sep 21	
4	Splenectomy in idiopathic thrombocytopenic purpura. Why?	Jan 20	
5	Idiopathic thrombocytopenic purpura	Feb 15	
6	Purpura and Hemophilia	Sep 11	
MCQS			
7	Condition where the platelet count is less than normal being called	Jan 24	
HEMOSTASIS			
LONG ESSAYS			
1	A 7 year old boy was brought to emergency room by her mother with the complaints of profuse bleeding from mouth, right shoulder joint swelling and pain following a fall while playing. She gives past history of similar episodes of bleeding with trivial injuries and further added that his cousin brother also has similar problem. Blood investigations showed-platelet count-3.5 lakhs, bleeding time-3mins, clotting time 25 mins, Prothrombin time-11 secs. Partial thromboplastin time-42 secs a) What is the most probable clinical condition & substantiate with finding of blood investigation b) Discuss the pathophysiology of above condition c) Describe the intrinsic pathway of blood coagulation	Oct 24	BT - 2-7 CL - 15
2	Depict the coagulation pathways using suitable flow charts. Briefly describe the fibrinolytic system. Write the physiological basis for why blood does not clot in the circulation normally	Nov 23	
3	A male child 3 years old was brought to a doctor with a complaint of bleeding from the nose, mouth, urinary tract, alimentary tract and skin after trivial injury. Sometimes swelling of the joints with pain and fever was also noticed. The bleeding was not profuse, but it was persistent. A careful history revealed similar bleeding tendency in male relatives. Investigations revealed that the coagulation time was prolonged. The bleeding time, prothrombin time and platelet count was normal. • What is the most likely diagnosis • Describe the physiological basis coagulation mechanism of the two pathways involved in the coagulation mechanism • Why females are not usually affected by this bleeding disorder • What is the physiological basis for treatment of this disorder	May 23	
DIAGNOSIS: HEMOPHILIA			
4	A 16 year old boy had continuous oozing of blood following tooth extraction. Answer the following:	Jan 19	

DECIPHER-I

- What is the probable cause of bleeding?
- Describe the extrinsic pathway of clotting using a schematic diagram.
- Mechanism of action of heparin as an anticoagulant.
- Role of vitamin K in clotting.
- Explain why blood does not normally clot inside the body?

DIAGNOSIS : HAEMOPHILIA

A 12 years old boy had swelling in the knee joint after a small injury. His clotting time was 12 min. Answer the following :

- What may be the probable diagnosis and what is its cause ?
- Explain the clotting mechanism in detail.
- Mention and interpret the tests for assessing bleeding and clotting time.

DIAGNOSIS : HAEMOPHILIA

SHORT ESSAYS

- Describe the mechanism of clotting in glass tubes during blood collection. Jul 24
- Describe the mechanisms of blood coagulation Mar 21
- Describe the intrinsic pathway of coagulation. Aug 13
- Mention one test assessing it.

SHORT ANSWERS

- Use of anticoagulant - Heparin, in prolonging clotting time. Why? Feb 23
- Draw the schematic diagram to show the intrinsic pathway of blood clotting Aug 21
- Fibrinolytic system Aug 19
- Heparin prevents blood coagulation in vivo .Why? Aug 18
- Fibrinolytic system Feb 16
- Dicumarol as an anticoagulant. Why? Aug 14
- Bleeding tendency of vitamin K deficiency. Why? Feb 13
- Clotting occurs when blood is kept in a glass tube. Why? Aug 12
- Intrinsic mechanism of coagulation Sep 11

MCQS

Single response type

- A laboratory report showing normal clotting time with an increased bleeding time is associated with Jul 24
 - Hemophilia A
 - Thrombocytopenia purpura
 - Christmas disease
 - Vitamin K deficiency

old question(1 mark)

- Natural anticoagulant is May 23
- Fibrinogen is converted into fibrin by..... May 23
- Deficiency of clotting factor XI leads to..... Feb 22
- Purpura is caused due to deficiency of..... Feb 22

LONG ESSAYS

- A 20-year-old boy who lost about 2 litres of blood following a road traffic accident, when transfused with blood developed, irritability, itching at the Jul 23

BLOOD GROUPS

Jan 18

PHYSIOLOGY

DECIPHER-I

- infusion site and all over the body, pain in the back and difficulty in breathing
- What can be the cause for the symptoms
 - Define Landsteiner's law
 - What is the physiological basis of blood grouping systems
 - What are the precautions to be taken before blood transfusion
 - What is autologous blood transfusion

SHORT ESSAYS

- A two-day-old newborn child had severe pallor and jaundice on examination. The mother reveals a history of previous miscarriages, and her blood group was "O" negative. What is the most probable reason for this clinical condition. Write briefly on the skills needed to educate the family about this clinical condition. Jul 24
- What is erythroblastosis foetalis. How can this be prevented. Feb 23
- Describe the dangers associated with blood transfusion. Explain what precautions could be taken to prevent them Aug 21

SHORT ANSWERS

- Hemolytic disease of newborn(HDN) Jul 23
- Mismatched blood transfusion Feb 22, Sep 21
- Concept of universal donor and recipient Sep 21
- Exchange transfusion in Erythroblastosis fetalis Feb 22
- List the hazards of blood transfusion Mar 21
- Erythroblastosis fetalis Aug 18
- Rh incompatibility Aug 16
- Bombay blood group Aug 15
- Rh blood group system Aug 12
- Rh factor and its clinical significance Mar 12

MCQS

- Rh incompatibility seen in Feb 23
- Blood is stored in blood banks at degree centigrade Feb 22

TISSUE FLUID

SHORT ANSWERS

- Explain the physiological basis of edema formation in hypoproteinemia May 22
- With the aid of a diagram. Explain how capillary fluid exchange is modified in hypoproteinemia. Feb 22

MCQS

- Non pitting oedema is seen in Feb 23

CARDIOVASCULAR SYSTEM

FUNCTIONAL ANATOMY OF THE HEART

SHORT ANSWERS

- Brief note on heart sounds Feb 23 ✓
- Physiological basis of pacemaker potential Jul 23, Aug 19
- Draw and label : Conducting system of heart Feb 22, Jan 18, Aug 16

4	Draw and label : pacemaker potential	PHYSIOLOGY-I
5	Pacemaker potential	Jan 20
		Aug 19

RECORDING OF ELECTRICAL ACTIVITY OF HEART

LONG ESSAYS

- 1 A 45-year-old man was brought to the emergency department with pain in the chest and left upper arm for the past 30 minutes. His ECG showed ST segment elevation and the cardiac enzymes were elevated.
 - Name the most probable clinical condition.
 - Describe the physiological basis for the changes in the ECG and cardiac enzymes
 - List the uses of ECG
 - Describe the special features of coronary circulation
- 2 A 60 year old man presented with acute retro sternal chest pain radiating to the inner aspect of left arm. The ECG showed ST segment elevation in some of the leads.
 - What is the most probable diagnosis?
 - What are the other ECG changes that may occur in this condition?
 - Explain the leads used in recording ECG
 - With the help of a diagram describe the waves, intervals and segments of normal ECG recording in Lead I

DIAGNOSIS : MYOCARDIAL INFARCTION

SHORT ANSWERS

- 3 Draw and label the ionic basis of the ventricular action potential. Describe the physiological basis of A-V- nodal delay
- 4 With the help of a neat labelled diagram depict the physiological basis for ECG changes in acute myocardial infarction.
- 5 Draw and label: Normal ECG wave
- 6 Draw the pacemaker potential and indicate the ionic basis.
- 7 Physiological basis of Prolongation of PR interval
- 8 Draw and label a normal ECG tracing in lead II
- 9 Origin and spread of cardiac impulse
- 10 AV nodal delay
- 11 PR interval is prolonged in first degree heart block .Why?
- 12 Draw and label : ECG in lead II
- 13 P-R interval
- 14 Q wave in ECG
- 15 Draw and label : Normal ECG

MCQS

Single response type

- 16 Duration of AV nodal delay, during conduction of impulse from atria to ventricle xvii Duration of A-V nodal
 - a) 0.1 sec
 - b) 0.5 sec
 - c) 0.3 sec
 - d) 0.4 sec
- 17 The ECG changes in First degree Heart Block shows
 - a) Prolonged QT interval
 - b) Prolonged PR interval

DECIPHER-I

- | | | |
|---|--------------------------|--------------|
| c) ST-segment elevation | d) ST segment depression | PHYSIOLOGY-I |
| old question(1 mark) | | |
| 18 Tall T waves in ECG is indicative of | Jan 24 | |
| 19 QRS complex in ECG indicates..... | Aug 21 | |

CARDIAC CYCLE

LONG ESSAYS

- 1 Define cardiac cycle. Enumerate the phases of cardiac cycle. With the help of a neat labeled diagram, describe the pressure and volume changes in the ventricles. Write the physiological basis and functional significance of AV nodal delay

SHORT ESSAYS

- 2 Define cardiac cycle. Explain the mechanical and pressure events of it with help of a neat labelled diagram.
- 3 Describe briefly the mechanical events of cardiac cycle

SHORT ANSWERS

- 4 Heart sounds
- 5 Fourth heart sound
- 6 End diastolic ventricular volume
- 7 Draw and label : Cardiac cycle
- 8 First and second heart sounds
- 9 Draw and label : Left ventricular pressure changes recorded during a normal cardiac cycle
- 10 Right atrial pressure changes
- 11 Draw and label : Right ventricular pressure curve during a normal cardiac cycle

MCQS

Multiple response type

- 12 The first heart sound corresponds in time with
 - 1. Closure of the atrioventricular valves.
 - 2. The P wave of the electrocardiogram
 - 3. A fall in atrial pressure
 - 4. A rise in ventricular pressure
 a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4

Assertion and reason type

- 13 (A): During isovolumetric contraction phase, the ventricular pressure raises steeply
(R): At the end of isovolumetric contraction phase, semilunar valves open
 - a) Both A & R are correct and R is the reason for A
 - b) Both A & R are correct but R is not reason for A
 - c) A is correct R is incorrect
 - d) A is incorrect R is correct

old question(1 mark)

- 13 End systolic ventricular volume is.....
- 14 Heart sound produced due to closure of the aortic and pulmonary valves is....

HEMODYNAMICS		PHYSIOLOGY-I
DECIPHER-I		
SHORT ANSWERS		
1	Skin is cold in hypovolemic shock. Why?	Aug 13, Aug 14
HEART RATE		
SHORT ANSWERS		
1	Describe the factors regulating heart rate	May 22
2	Severe tachycardia is harmful to the individual. Why?	Aug 19
3	Change in heart rate during exercise. Why?	Jan 19
MCQS		
Assertion and reason type		
4	(A): Parasympathetic stimulation slows the cardiac conduction (R): Acetylcholine released at vagal endings decreases the excitability of AV fibers a) A is incorrect R is correct b) Both A & R are correct but R is not reason for A c) A is correct R is incorrect d) Both A & R are correct and R is the reason for A	Jul 24
old question(1 mark)		
5	The law which states heart rate is inversely proportional to blood pressure is called -----	May 23
6	A law denoting relationship between heart rate and blood pressure is.	May 22
7	Decreased heart rate in athletes is due to ----- in vagal tone.	Feb 22
8	Alteration of heart rate in different phases of respiration is called -----	Feb 22
CARDIAC OUTPUT		
LONG ESSAYS		
1	Define cardiac output. Give the formula for cardiac index & mention the normal value. Describe the various factors maintaining cardiac output	Oct 24
SHORT ESSAYS		
2	Regulation of cardiac output	May 23
3	Explain the factors that determine cardiac output. What is cardiac failure.	Feb 23
4	How cardiac output is regulated	Feb 22
5	Define cardiac output, cardiac index. Regulation of cardiac output	Mar 21
6	Explain factors regulating cardiac output	Nov 20, Jan 18
7	Describe the factors affecting cardiac output and add a note on Brain bridge reflex	Feb 14
VASCULAR SYSTEM, ARTERIAL BLOOD PRESSURE AND ARTERIAL AND VENOUS PULSE		
LONG ESSAYS		
1	A forty-two-year-old male complains of severe headaches in the morning, with a blurring of vision for a week. For two days, he complains of severe fatigue and this morning had an episode of a nose bleed with increasing severity of the headache. He reported to the emergency room and was examined by the doctors. There was no previous history of similar illness. On Examination, his blood pressure was 160/110mmHg and when repeated after 15 minutes was 158/110 mmHg. • What is the patient suffering from. • Define the term blood pressure. What are the normal values for systolic	Feb 23

DECIPHER-I		PHYSIOLOGY-I
and diastolic blood pressure.		
• Explain the long-term regulation of blood pressure. • What are the non-pharmacologic methods to reduce blood pressure		
DIAGNOSIS: HYPERTENSION		
2	Describe the regulation of blood pressure	Feb 23
3	An individual was brought to a hospital from the site of an accident. He showed following signs and symptoms: Restlessness, extreme weakness, pale, cold, clammy skin; rapid, thready pulse hypotension, oliguria • What is your diagnosis • Define it and classify it. Explain it with examples • How do you explain the signs and symptoms • What are compensatory regulatory mechanisms which will operate in the body to bring back all the signs and symptoms to normal • What immediate treatment do you suggest	Feb 22
4	An 18 years old boy meets with a road traffic accident, gets injured and loses 20% of blood volume. Answer the following • Define shock • Describe the Baroreceptor Mechanism of blood pressure regulation • Classification and major causes of various types of shock	Sep 21
5	A 55- year old man is brought to the casualty after a road traffic accident. He was disoriented and irritable. On examination his blood pressure was 90/40 mmHg, respiratory rate was 24/minute and pulse rate was 150 /minute. His ECG did not show any abnormality. • What is your diagnosis ? • Discuss the physiological basis for various clinical features seen and management of this condition • Describe baroreceptor reflex.	Aug 21
DIAGNOSIS : HYPOVOLAEMIC SHOCK		
6	A 55-year-old businessman was brought to medicine casualty with severe chest pain. He was sweating and his BP was 140/94 mm Hg, heart sounds were muffled and the ECG showed ST elevation in lead II and avf. • What is the most probable diagnosis? • Discuss the pathophysiology of this condition and principles of management. • What are the special features of coronary circulation?	Mar 21
A 50-year-old chronic smoker complains of severe chest pain, crushing in nature, radiating to left shoulder and inside of the left arm. The chest discomfort brought on by the exertion was relieved by rest. After 2 hours he visits a hospital. Emergency room examination showed ST segment elevation, tachycardia and hypertension • What is he probably suffering from ? • What is the cause for this pain ? • What is the underlying mechanism for the above complaints ? • Explain the salient features of coronary circulation		Nov 20
DIAGNOSIS : MYOCARDIAL INFARCTION		
7	A 16 year old NCC cadet, lined up for a parade fell down unconscious. He	Aug 18

DECIPHER-I

had been standing in the hot sun for an hour. On examination, his blood pressure was 60/50 mmHg. Pulse rate was regular and was breathing normally. Soon, he regained consciousness. From your knowledge of physiology, Answer the following:

- What is the most likely diagnosis?
- What are the factors determining blood pressure
- What are the physiological principles applicable for the immediate management here?
- Explain the short term regulation of blood pressure.

DIAGNOSIS : POSTURAL HYPOTENSION

- 8 A 60 years old man complaints of chest pain on exertion, radiating to his left arm and severe shortness of breath. Answer the following.

- What is the most probable condition he is suffering from?
- Mention the most common investigation done in such a patient and describe with the help of diagram the changes that are expected in this patients .
- What are the functional features of coronary circulation?

DIAGNOSIS : MYOCARDIAL INFARCTION

- 9 A motor cyclist met with a road traffic accident and was admitted in the casualty. Clinical examination reveal cold and clammy extremities, rapid thread pulse, and a blood pressure of 70/50mm of Hg. Answer the following

- What is the probable clinical condition?
- Define shock and name the different stages of shock.
- Describe the compensatory mechanism in the first stages of shock.
- What is neurogenic shock?

DIAGNOSIS : SHOCK

- 10 A 45 years old man is having high blood pressure. Answer the following
- What are the probable causes of high BP
 - Mention the factors maintaining blood pressure.
 - Describe the neural regulation of blood pressure

- 11 A 55 year old obese man complained of headache, giddiness, irritability for the last two months. On examination by a doctor, his BP was found to be 130/100 mmHg by auscultatory method. Three days later, he visited another doctor. According to him, his BP was found to be 170/100 mmHg after using both palpatory and auscultatory methods
- What is the correct BP in this patient and why?
 - What is the cause for this difference in the recording?
 - Define mean arterial pressure & pulse pressure giving their values
 - Describe the possible renal mechanism causing hypertension
 - Mention Physiological basis for management of hypertension

SHORT ESSAYS

- 12 Describe the baroreceptor response to high blood pressure.
- 13 Short term regulation of blood pressure
- 14 Short answer about intermediate and long term regulation of blood

PHYSIOLOGY-I

Jul 17

Feb 16

Feb 15

Sep 11

DECIPHER-I

pressure

PHYSIOLOGY-I

- 15 Explain homometric and heterometric regulation of blood pressure.
- 16 Long term regulation of blood pressure
- 17 Change of posture from supine to standing causes tachycardia
- 18 Jugular venous pulse

May 23
Aug 16
Aug 15
Aug 14

SHORT ANSWERS

- 19 A 35 year old male met with a road traffic accident and lost substantial amount of blood which lead to signs of fall in blood pressure, tachycardia and rapid breathing. Name the probable type of shock in this patient and discuss the pathophysiology and management of the same.

Oct 24

- 20 Draw and label a normal jugular venous pulsation tracing.

Jul 23, May 23,
Feb 16

- 21 Describe the long-term regulation of blood pressure. Add a note on hypertension

May 23

- 22 Role of baroreceptors in blood pressure regulation

Feb 22

- 23 Tachycardia in hemorrhagic shock why?

Feb 22

- 24 Draw a tracing of the jugular venous pressure and give the basis of each wave.

Aug 21

- 25 Myocardial infarction

Mar 21

- 26 Renin-Angiotensin mechanism in blood pressure regulation

Nov 20

- 27 Factors affecting venous return

Aug 19

- 28 Starling's forces

Aug 18

- 29 Starling's forces in capillary fluid exchange

Jul 17

- 30 Starling's law of muscle contraction

Jul 17

- 31 Raised intracranial pressure causes bradycardia and hypertension. Why?

Aug 15

- 32 Venous return

Aug 14

- 33 Prolonged standing results in fainting attacks .Why?

Feb 14

- 34 Factors influencing venous return

Feb 13

MCQS

Multiple response type

- 35 The following waves are seen in Jugular venous pressure tracing
- 1) p 2) a 3) c 4) v
- a) 1, 2 and 3 b) 1.2 and 4 c) 1, 3 and 4 d) 2, 3 and 4

Oct 24

old question(1 mark)

- 36 a wave of jugular venous pulse is caused due to.....
- 37 Hypoxia is the most potent stimulus for chemoreceptors.
- 38 The shock produced due to hypersensitivity reaction is
- 39 Anticoagulants in Myocardial infarction

Jan 24, May 22

Nov 23

Feb 22

Nov 20

CARDIOVASCULAR ADJUSTMENTS IN EXERCISE

Aug 21

SHORT ESSAYS

- 1 Describe the cardiorespiratory changes during exercise

Jan 24, Jul 17

SHORT ANSWERS

- 2 Resting bradycardia in athletes

CIRCULATION THROUGH SPECIAL REGIONS

May 22

LONG ESSAYS

- 1 Discuss the characteristic features of coronary circulation. Explain the

DECIPHER-I	various factors regulating coronary blood flow.	PHYSIOLOGY-I
SHORT ESSAYS		
2	Describe the peculiarities of the coronary circulation	Oct 24, Aug 15
SHORT ANSWERS		
3	Entero-hepatic circulation	Jul 17
4	Describe the peculiarities of the coronary circulation	Feb 15
5	Special features of coronary circulation	Sep 11
MCQS		
6	The wheel in the triple response is due to	May 22, Mar 21

RESPIRATORY SYSTEM

STRUCTURE AND FUNCTIONS OF RESPIRATORY SYSTEM

SHORT ESSAYS		
✓ 1	Explain the role of surfactant in respiration and maintaining the stability of the alveoli.	Feb 23
SHORT ANSWERS		
✓ 2	Non-respiratory functions of lung	Jul 23
✓ 3	Surfactant	Jul 23
✓ 4	What is surfactant. Write down its functions.	Feb 23
✓ 5	Draw a neat labelled diagram of the respiratory membrane, indicating the factors affecting diffusion across it.	Feb 22
✓ 6	Draw and label: Respiratory membrane	Jan 20
✓ 7	Corticosteroids are administered to a lady in preterm labour. Why?	Aug 18
✓ 8	Pulmonary surfactant	Aug 18, Jan 18, Feb 16
✓ 9	Alveoli are dry normally. Why? CGPT.	Jul 17, Aug 13
✓ 10	Alveoli do not collapse during expiration. Why?	Feb 13, Aug 12
✓ 11	Synthesis and functions of surfactants	Mar 12
MCQS		
✓ 12	Basic rhythm of respiration is maintained by.....	May 23
✓ 13	Hyaline membrane disease is caused due to deficiency of.....	May 23
✓ 14	The lungs are protected by	Mar 21
✓ 15	Emphysema is characterized by	Mar 21

MECHANICS OF VENTILATION AND PULMONARY FUNCTION TESTS

LONG ESSAYS		
✓ 1	A 55-year-old man who is a chronic smoker was brought to the medical emergency with complaints of breathlessness, wheeze and cough with sputum for the past one week. He gets similar illness during the cold season for the past five years. On examination he has mild cyanosis, wheeze and crepitations. His chest is barrel shaped, RBC count is increased, forced vital capacity (FVC) is decreased and FEV1 is 60%. • Name the most probable clinical condition • Draw and label a spirogram showing the lung volumes and capacities. • Describe the physiological basis for the changes in RBC count and FVC. • Describe timed vital capacity and its clinical significance	Jan 24

DECIPHER-I

✓ 2	A 50 year old male come with complaints of difficulty in breathing. Auscultation revealed the presence of rhonchi in all the lung fields. Patient's pulmonary function tests revealed FVC decreased; FEV1=60% Answer the following : • What is FVC and FEV1 ? • Give the normal values of FEV1 and FEV2 • Describe the physiological basis for this change of FEV1 • What is the probable clinical condition? • What is the significance of FEV1 ? DIAGNOSIS : COPD	PHYSIOLOGY-I Mar 12
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SHORT ESSAYS

✓ 3	Explain the role of dynamic lung function tests in the diagnosis of respiratory disorders.	Jul 24
✓ 4	Intrapleural pressure is negative why?	Jan 24, Sep 21
✓ 5	Describe the respiratory pressure changes with diagrams. Add a note on V-P ratio.	Feb 22
✓ 6	Hyaline membrane disease	Sep 21
✓ 7	Define dead space. Describe the types	Mar 21
✓ 8	Explain pressure changes during normal respiratory cycle.	Nov 20
✓ 9	Physiological dead space	Aug 19
✓ 10	Lung compliance	Aug 15

SHORT ANSWERS

✓ 11	Forced Expiratory Volume in the 1 second (FEV1) in COPD	Feb 23
✓ 12	Draw and label : normal spirogram	Feb 22, Mar 21
✓ 13	Draw and label : Pressure changes in normal respiratory cycle	Jan 19
✓ 14	Draw and label : Pressure volume changes in the lungs and pleural space during normal respiration	Aug 18
✓ 15	Dead space	Jan 18
✓ 16	Draw and label : Spirometric recording of lung volumes	Jul 17
✓ 17	Draw and label : Lung volumes & capacities	Aug 14
✓ 18	Timed vital capacity	Feb 13
✓ 19	Vital capacity and timed vital capacity as lung function tests. Why?	Sep 11

MCQS

Multiple response type

20	Loss of pulmonary elastic tissue in 'emphysema' reduces 1. Physiological dead space 2. Gas exchange 3. Vital capacity 4. Forced expiratory volume in 1st second a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	Jul 24
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old question(1 mark)

21	Cessation of respiration during swallowing is called	Nov 23
22	Name the lung volume that cannot be measured using spirometer. <i>RV</i>	Nov 23
23	Difficulty in breathing on lying down is called <i>Orthopnea</i>	Feb 22
24	The volume of air that moves in or out during eactidal breath is called	Mar 21
25	Intrapleural pressure is normally negative because.....	Mar 21

DECIPHER-1

PULMONARY CIRCULATION

SHORT ESSAYS

- 1 Explain ventilation perfusion ratio
- 2 Describe the characteristics of pulmonary circulation

Feb 23

Aug 18

SHORT ANSWERS

- 1 Ventilation perfusion ratio
- 2 Physiological shunt
- 3 Haemoglobin saturation in arterial blood is usually less than 100%. Why?

Aug 16, Feb 18

Aug 16

Aug 15

MCQS

- 6 Normal ventilation perfusion ratio is 0.86

May 22

PULMONARY GAS EXCHANGE

SHORT ESSAYS

- 1 Classify hypoxia Explain the cause of the different types of hypoxia

Oct 24

SHORT ANSWERS

- 2 Factors affecting diffusion across respiratory membrane

Jan 19

- 3 Hypoxia in cyanide poisoning .Why?

Jan 19

- 4 Differentiate between Haldane and Bohr effect

Jan 19

- 5 Role of oxygen in treatment of carbon monoxide poisoning ?

Feb 16

- 6 Draw and label : Respiratory membrane

Aug 15

- 7 Chloride shift

Feb 15

- 8 Hypoxia

Aug 12

TRANSPORT OF GASES

LONG ESSAYS

- 1 Oxygen delivery to tissues will be greatly reduced in a patient with carbon monoxide poisoning.

Aug 14

Answer the following:

- What is the physiological basis for reduced oxygen delivery to the tissues?
- Describe the functional significance of oxygen haemoglobin dissociation curve.
- Mention the factors which will shift oxygen dissociation curve to right and left.

SHORT ESSAYS

- 2 Describe the various methods of carbondioxide (CO₂) transport in blood.

Nov 23

- 3 Add a note on chloride shift.

Jul 23

- 4 O₂ transport in blood

May 22

- 5 Describe the mechanisms of oxygen diffusion across lung

Mar 21

- 6 Describe carbon dioxide transport in the blood

SHORT ANSWERS

- 7 Sigmoid shape of the Oxygen Dissociation curve.

Jan 24

- 8 Oxygen hemoglobin dissociation curve

Feb 23

- 9 Draw and label : Oxygen hemoglobin dissociation curve

May 22, Sep 21,

Nov 20, Aug 16,

Aug 12

- 10 Transport of CO₂ in blood

Mar 21

- 11 Oxygen debt

Feb 14

- 12 Draw and label : Effect of pH on the oxygen-haemoglobin dissociation curve

Feb 14

DECIPHER-1

- 12 Draw and label : The effect of temperature and Ph on oxygen dissociation curve

PHYSIOLOGY-I

Mar 12

MCQS

Multiple response type

- 13 The following factors cause a shift of oxygen-Hemoglobin dissociation curve to the right
 - 1) Hypercapnia
 - 2) Increased 2,3 BPG
 - 3) Increased temperature
 - 4) Increased pH

Oct 24

old question(1 mark)

- 14 Influence of oxygen on the release of uptake of carbon dioxide is called ---- effect.

Feb 22

- 15 The maximum amount of carbon dioxide in human body is transported as...

Mar 21

REGULATION OF RESPIRATION

LONG ESSAYS

- 1 Mention the location of neural centers that regulate respiration. Describe the interaction between the various neural centers in regulation of respiration. Explain the effect of the transection at different levels in the brainstem.

Jul 24

- 2 Name the respiratory centres. Describe the neural regulation of respiration. Add a note on periodic breathing.

May 23

- 3
 - Name the location of the respiratory centres.
 - Explain their role in the regulation of respiration.
 - Describe the mechanisms of periodic breathing.

Aug 21

- 4 A 20 year old boy climbing a mountain suffered from shortness of breath after reaching about 3200m from sea level. Answer the following :

Mar 21

- Define hypoxia .
- Probable cause of hypoxia in this case .
- Characteristic features of different types of hypoxia .
- Treatment of hypoxia ?

- 5 Different types of cyanosis and their causes .

Aug 15

- 6 A 30 years old woman presented with history of cough and breathlessness that got worse during the winter months every year. She also complained of occasional whistling sounds arising from the chest during breathing. Answer the following:

Answer the following:

- What is the most likely clinical diagnosis of her condition?
- What major findings would her pulmonary function tests show ?
- What kind of medication would she likely benefit from ?
- Depict the different lung volumes and capacities with the help of a neatly labelled diagram.

DIAGNOSIS : BRONCHIAL ASTHMA

- 6 A 40 years old man was admitted to hospital with complaints of difficulty in breathing and was shortness of breath following a head injury. Answer the following.

Feb 14

DECIPHER-I

- With the help of diagram describe the two types of periodic breathing in such a patient.
- Explain the physiological basis for the changes in periodic breathing pattern.
- Describe the role of peripheral chemo receptors in regulation of normal respiration.

A road traffic accident victim was found to be unconscious and breathing in an irregular rhythm. From your knowledge of physiology answer the following :

- Name two types of periodic breathing .
- Explain the neural regulation of respiration .
- What is the mechanism of function of medullary chemo receptors?

SHORT ESSAYS

- Where are the chemoreceptors situated. How do they regulate respiration.
- Chemical regulation of respiration
- Explain the neural regulation of respiration
- Describe the neural control of respiration and add a note on Cheyne-stokes breathing
- Explain the neural regulation of respiration
- Describe the role of chemo-receptors in regulation of respiration

SHORT ANSWERS

- How is hypoxia classified. Explain any one in detail.
- Cyanosis
- Hering-Breuer reflex
- Cheyne-stokes breathing
- Explain the physiological basis of Chvostek's sign
- Draw and label: Physiological organisation of respiratory centres
- Respiratory rhythm
- Peripheral chemo receptors
- Dyspnoeic index
- Periodic breathing

MCQS

Assertion and reason type

- (A): Bronchial asthma is an obstructive lung disorder
(R): FEV1/FVC ratio is increased in Bronchial Asthma
a) Both A & R are correct and R is the reason for A
b) Both A & R are correct but R is not reason for A
c) A is correct R is incorrect
d) A is incorrect R is correct
- (A): Biot's breathing is an irregularly irregular breathing pattern
(R): It is caused by diabetic ketoacidosis
a) Both A & R are correct and R is the reason for A
b) Both A & R are correct but R is not reason for A
c) A is correct R is incorrect

PHYSIOLOGY-I

DECIPHER-I

- A is incorrect R is correct

PHYSIOLOGY-I

Single response type

- The basic respiratory rhythm is generated in
a) Apneustic center b) Ventral medulla
c) Pneumotaxic center d) Cerebrum

old question(1 mark)

- Bluish discoloration of skin and mucus membrane is called
- The tissue capacity to utilise oxygen is lost in type of hypoxia
- Combination of hypoxia and hypercapnia is called

ENVIRONMENTAL PHYSIOLOGY

LONG ESSAYS

- Eighteen hours after arrival at an altitude of 12000 feet, a man has headache, irritability, insomnia, breathlessness, nausea and vomiting. Answer the following :
• What is he suffering from ?
• What are the changes taking place in the body systems during acclimatization to high altitude ?
• Explain the physiological basis of these changes .

DIAGNOSIS : ALTITUDE SICKNESS

SHORT ESSAYS

- Describe the pathophysiology of nitrogen narcosis. Add a note on its management
- Describe the cardio-respiratory adjustments in high altitude.
- Discuss the compensatory changes at high altitude
- Discuss the cause and clinical features and treatment of dysbarism

SHORT ANSWERS

- Describe physiological mechanisms to reduce the effects of hypoxia in natives of high altitude.
- Explain the physiological basis of symptoms in decompression sickness.
- Dysbarism
- Acute respiratory distress syndrome is seen in premature infants. Why?
- Hyperventilation is seen when lowlanders travel to high altitude. Why?
- Decompression sickness
- Prolonged stay at high altitude increases the haematocrit. Why?
- Hypoxic hypoxia
- Acclimatization in high altitude
- Caisson disease or decompression sickness

MCQS

Assertion and reason type

- (A): Mountain dwellers in high altitude have polycythemia as compensatory mechanism
(R): Low partial pressure of oxygen in high altitude (hypoxic hypoxia) promotes erythropoiesis
a) A is incorrect R is correct
b) Both A & R are correct but R is not reason for A

DECIPHER-I

- c) A is correct R is incorrect
d) Both A & R are correct and R is the reason for A
- 17 (A): Nitrogen Narcosis occurs at high nitrogen pressures at about 120 feet depth
(R): Nitrogen narcosis has features similar to alcohol intoxication
a) Both A & R are correct and R is the reason for A
b) Both A & R are correct but R is not reason for A
c) A is correct R is incorrect
d) A is incorrect R is correct

Jul 24

old question(1 mark)

- 18 Cause for 'Bends' (pain in joints) in deep sea divers is Jan 24
19 In caissons disease pain in the joints is due to Mar 21
20 Altitude sickness is typically due to Mar 21

ARTIFICIAL RESPIRATION

SHORT ANSWERS

- 1 Mouth to mouth respiration is the best form of artificial respiration Mar 12

GASTROINTESTINAL SYSTEM

INTRODUCTION

SHORT ESSAYS

- 1 Describe the mechanisms of digestion and absorption of fat along the gastro-intestina. May 22

SHORT ANSWERS

- 2 Describe the enteric nervous system.
Write the physiological basis for achalasia cardia. May 22

MCQ

- 3 (A): The pattern of motor activity in the gastrointestinal tract during the fed state is called the migratory motor complex
(R): Motilin is mainly responsible for migratory motor complex
a) Both A & R are correct and R is the reason for A
b) Both A & R are correct but R is not reason for A
c) A is correct R is incorrect
d) A is incorrect R is correct Jul 24

SALIVARY GLANDS AND ESOPHAGUS

SHORT ESSAYS

- 1 Components and functions of saliva Feb 23

SHORT ANSWERS

- 2 Composition and functions of saliva Jul 23
3 Stages of deglutition Feb 22
4 Functions of saliva Aug 16

MCQS

Assertion and reason

- 5 (A): Achalasia cardia is a lower esophageal sphincter disorder presents with dysphagia Oct 24

DECIPHER-I

- (R): The cause for it is excess secretion of neuro transmitters like VIP and Nitrous oxide
a) Both A & R are correct but R is not reason for A
b) Both A & R are correct and R is the reason for A
c) A is correct R is incorrect
d) A is incorrect R is correct

PHYSIOLOGY-I

old question(1 mark)

- 6 Carbohydrate digesting enzyme present in saliva is
7 The enzyme presents in saliva that acts on starch Jan 24, May 22
8 Ptyalin is an enzyme present in Feb 23
9 Digestion of proteins occur in Feb 22
Mar 21

STOMACH

LONG ESSAYS

- 1 • List the cells and secretion from the Oxyntic gland of the stomach.
• With the help of a diagram explain the mechanism of gastric acid secretion.
• Explain the phases of gastric acid secretion Mar 21

SHORT ESSAYS

- 2 Describe the regulation of the different phases of gastric secretion. Jul 24
3 Describe the phases of deglutition. Add a note on Achalasia cardia Jan 24
4 Describe the phases of gastric secretion. How is it regulated. Nov 23, Feb 22
5 Describe the mechanism of secretion of HCL. Add note on management of peptic ulcer. May 23
6 Explain the regulation of gastric juice secretion in different phases Aug 21, Nov 20
7 Describe the mechanism of gastric acid secretion Aug 15
8 Describe the functions and regulation of hydrochloric acid secretion Mar 12

SHORT ANSWERS

- 9 Explain the physiologic basis of vagotomy in the treatment of peptic ulcer. Jul 24
10 Draw and label: HCL secretion by parietal cells Jan 24, Jul 23
11 Alkaline tide after a meal. Jan 24
12 Describe the importance of dietary fiber Nov 23, Jul 23
13 Use of Oral Rehydration Solution (ORS) in treatment of diarrhea. Feb 23
14 Use of H2 receptor blockers in peptic ulcer. Feb 23
15 Regulation of gastric secretion Feb 23
16 Post prandial alkaline tide Feb 22
17 Use of proton pump inhibitors in peptic ulcer Sep 21
18 Draw and label :Mechanism of gastric HCL secretion Sep 21
19 Gastric mucosa is resistant to auto-digestion Jan 19
20 Mucosal barrier and peptic ulcer Jan 18
21 Cephalic phase of gastric juice secretion Aug 18
22 Draw and label :Mechanism of gastric hydrochloric acid secretion Jul 17
23 Control of gastric secretion Aug 16, Aug 14, Sep 11
24 Postprandial alkaline tide Aug 16, Aug 15
25 Gastrectomy produces pernicious anemia . Why?

DECIPHER-I

26	Mechanism of gastric hydrochloric acid secretion	Feb16, Feb 13
27	Gastric emptying time	Feb 14
28	Pathophysiology of peptic ulcer	Aug 13
29	Peptic ulcer	Aug 12

MCQS

Case scenario based

30	A 53 year male executive having erratic working hours and food habits complains of epigastric pain, nausea and bloating frequently which is relieved by food. As suggested by gastro enterologist, the patient underwent endoscopy which showed inflammation of gastric mucosa. Answer the following questions based on this scenario 1. The probable cause of acid peptic disease in this case would be a) Stress induced excess acid production b) Stress induced excess intrinsic factor production c) Increased lipase secretion due to erratic food habits d) Increased somatostatin secretion due to erratic working hours 2) The gastric mucosal cell that secretes HCL A) Gastric cells b) Peptic cells c) Chief cells d) Parietal cells 3) The proton pump that plays a major role in acid secretion is a) Na+K+ ATP ase b) H+K+ ATPase c) Na+H+ATPase d) H+Ca+ATPase 4) Peptic ulcer disease is strongly associated with infection of gut with the following bacterium a) H pylori. b) H. baculiformis c) H. Suis d) H equorum 5) The factor that inhibits HCL secretion in stomach a) Vagal stimulation b) Somatostatin c) Gastrin d) Histamine	Oct 24
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old question(1 mark)

31	Intrinsic factor of castle is produced by ----- cells.	Jan 24
32	The gastric gland which secretes HCL is.....	May 22
33	Stomach epithelial cells secrete	Mar 21
34	The final product of carbohydrate digestion is	Aug 21

PANCREAS

SHORT ESSAYS

1	Describe the composition and regulation of pancreatic juice secretion	Feb 16
2	Regulation of pancreatic exocrine secretion	Aug 14
3	Describe the functions & regulations of pancreatic juice secretion	Sep 11

SHORT ANSWERS

4	Physiological basis for steatorrhoea in exocrine pancreatic deficiency.	Oct 24, Jan 24
5	Steatorrhoea following pancreatectomy. Why?	Jan 20
6	Proteolytic pancreatic enzymes	Aug 18, Feb 14
7	Pancreatic juice composition	Jan 18
8	Steatorrhoea in diseases that destroy exocrine pancreas. Why?	Aug 13
9	Steatorrhoea occurs after pancreatectomy. Why?	Aug 12
10	Steatorrhoea in acute pancreatitis. Why?	Mar 12

MCQS

DECIPHER-I

Multiple response type

11	The protein splitting enzymes of pancreas are 1) Carboxy peptidase 2) Elastase 3) Cholestrol esterase 4) Trypsin a) 1, 2 and 4 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 3	PHYSIOLOGY-4 Jul 24
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old question(1 mark)

12	Name the substance produced by pancreas to prevent its autodigestion.	Nov 23
13	Hormone stimulating secretion of alkaline pancreatic juice is.....	Jan 24
14	Steatorrhea occurs due to deficiency of	May 23

LIVER AND BILIARY SYSTEM

SHORT ESSAYS

1	Enumerate the plasma proteins along with their site of production. Describe their functions. (3+5)	Jan 24
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SHORT ANSWERS

2	Enumerate the functions of the Liver.	Jan 24
3	Plasma proteins	Jul 23
4	Define and classify jaundice	May 23
5	Movements of small intestine	Feb 22
6	Functions of bile	Mar 21, Nov 20, Jan 20
7	Jaundice	Mar 21
8	Steatorrhoea	Nov 20
9	Entero-hepatic circulation	Jan 19, Aug 19, Jul 17

MCQS

Multiple response type

10	Which of the following are the physiological actions of Cholecystokin-Pancreozymin 1. Relaxation of the lower esophageal sphincter 2. Gall bladder contraction 3. Increased pancreatic secretion 4. Increased gastric secretion a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	Jul 24
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Single response type

11	Cholagogues are substances that cause..... a) Contraction of gallbladder b) Increase bile secretion c) Concentrate bile d) Acidify bile	Jul 24
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old question(1 mark)

12	Substances that can cause contraction of the gall bladder are called	Nov 23
13	Physiological basis for fat malabsorption in obstructive jaundice.	Nov 23
14	Name the tissue macrophages in liver.	Nov 23
15	The osmotic pressure exerted by plasma proteins is called	Feb 23
16	Bile enters the digestive tract through	May 22
17	Normal serum bilirubin level is	

SMALL INTESTINE

SHORT ANSWERS

DECIPHER-I

- Small intestinal hormones
- Law of intestine
- Small intestinal movements

MCQS

Multiple response type

- Surgical removal of 90 percent of the small intestine may cause a decrease in
 - Bone mineralization (osteomalacia)
 - The fat content of the stools
 - Blood hemoglobin level
 - Body weight
- a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4

LARGE INTESTINE

SHORT ESSAYS

- Describe the functions of large intestine and add a note on cause and pathophysiology of Megacolon (Hirschsprung's disease)

SHORT ANSWERS

- Describe the role of colonic bacteria
- Mass peristalsis

MCQS

- Defecation after feeding is a rule in children. This is called -----
- Defecation observed immediately after a meal in children is due to ... reflex

MOVEMENTS OF GASTROINTESTINAL TRACT

SHORT ESSAYS

- Name the types of intestinal movements and explain their functions.
- Stages of deglutition
- Name the components of the enteric nervous system and outline its functions

SHORT ANSWERS

- Types of movements in large intestine
- Defecation reflex
- Second stage of deglutition
- Peristaltic movements
- De-glutition reflex
- Receptive relaxation
- Law of intestines
- De-glutition apnoea
- Phases of deglutition

RENAL PHYSIOLOGY

FUNCTIONAL ANATOMY OF KIDNEY

SHORT ANSWERS

- Draw and label the juxta-glomerular apparatus. Describe the physiological basis for renal splay
- Draw and label :Nephron
- Juxtaglomerular apparatus
- Draw and label: Juxtaglomerular apparatus
- Renin anemia
- Non renal functions of kidney

DECIPHER-I

- Anemia is seen in patients with renal disease. Why?

MCQS

Multiple response type

- Juxtaglomerular apparatus consists of the following structures
 - Mesangial cells
 - Juxtaglomerular cells
 - Principal cells
 - Macula densa
- a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4

Old one word answers

- The name of cells secreting renin in kidney
- Part of the nephron in which the maximum amount of water is reabsorbed is

MECHANISM OF FORMATION OF URINE

LONG ESSAYS

- Describe the role of counter current multiplier and exchanger system in the concentration of urine. Add a note on renal failure and artificial kidney.
- A 48 year old man suffering from diabetes mellitus had increased frequency of micturition
 - What is the physiological basis of the polyuria?
 - What are the mechanisms operating in the nephron for the concentration of urine?
 - Add a note on free water clearance.

SHORT ESSAYS

- Describe water reabsorption in the different parts of nephron. Explain the role of hormones in water reabsorption.
- Describe the mechanism of water reabsorption from the renal tubules. Add a note on anuria
- With the aid of a diagram, explain the mechanism of Micturition.
- Counter current mechanism
- Factors influencing glomerular filtration
- Explain the mechanism of maintaining osmotic gradient in renal medullary interstitium
- Explain the mechanisms of water re-absorption in renal tubule
- Describe the counter current multiplier in the kidney

SHORT ANSWERS

- Describe the mechanisms regulating glomerular filtration rate.
- Describe the physiological basis for renal splay.
- Tubulo glomerular feed back
- Explain the role of 'Vasa Recta' in renal function.
- In humans effective renal plasma flow is _____
- Urine output is decreased in summer season because _____
- Draw and label : juxta glomerular apparatus
- Splay
- Explain the physiological basis of glycosuria

DECIPHER-I

20	Glomerular filtration rate	Feb 22, Aug 18
21	Describe the role of bicarbonate buffer system in acid-base balance	Mar 21
22	Factor affecting glomerular filtration rate	Mar 21, Nov 20
23	Counter current exchanger mechanism	Nov 20
24	Glomerulo-tubular feedback	Jan 19
25	Tubular maximum for glucose	Jan 19, Feb 15
26	Proteinuria occurs in renal diseases. Why?	Aug 18
27	Urine output is decreased in summer season. Why?	Aug 16
28	Water re-absorption by renal tubules	Feb 16
29	Renal clearance	Aug 15
30	Filtration pressure in glomerulus	Feb 15
31	Nephrotic syndrome	Aug 14
32	Splay in renal glucose reabsorption curve	Aug 14
33	Auto regulation of glomerular filtration rate	Feb 14
34	Draw and label: Splay	Aug 13
35	Role of juxta glomerular apparatus in the regulation of ECF volume	Mar 12
36	Renal plasma clearance values for inulin, PAH and glucose their significance	Sep 11
37	Draw and label: Counter current multiplier and exchange system in renal tubules	Sep 11

MCQS

Assertion and reason

38	(A): Auto regulation of GFR is maintained within systemic arterial blood pressure range of 80- 160 mmHg (R): Myogenic theory mechanism controls renal blood flow and GFR a) Both A & R are correct and R is the reason for A b) Both A & R are correct but R is not reason for A c) A is correct R is incorrect d) A is incorrect R is correct	Oct 24
39	(A): Proximal tubular cells have a large number of tight junctions (R): 80% of the sodium filtered is reabsorbed in the proximal convoluted tubule a) Both A & R are correct but R is not reason for A b) Both A & R are correct and R is the reason for A c) A is correct R is incorrect d) A is incorrect R is correct	Jul 24

Multiple response type

40	Renal medullary hyperosmolarity is due to 1) Increased Na ⁺ 2) increased urea 2) 3) Increased K ⁺ 4) Increased glucose a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	Oct 24
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Single response type

41	The force that oppose filtration in glomerulus is a) Decreased hydrostatic pressure inside the Bowman's capsule of glomerular capillaries b) Decreased colloid pressure of glomerular capillaries	Oct 24
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PHYSIOLOGY-I

DECIPHER-I

c) Increased filtration coefficient	
d) Decreased hydrostatic pressure inside glomerular capillaries	
42 The prime driving force for a counter current multiplier system is	PHYSIOLOGY-I Jul 24
a) Urea recycling	
b) Medullary hyperosmolarity	
c) Action of ADH in collecting duct	
d) Sodium reabsorption in thick ascending loop of Henle	

old question(1 mark)

43	Ideal substance for measuring the GFR is	
44	Normal value of Glomerular Filtration Rate is	Jan 24
45	Normal filtration fraction is 0.2 $0.16-0.20$	Nov 23
46	The protein like channels responsible for water absorption in distal convoluted and collecting tubules of kidney is called	May 23
47	Para Amino Hippuric Acid (PAH) is used to estimate	May 23
48	Ideal substance used to measure GFR is	May 22
49	Normal value of renal threshold is	Mar 21

LOWER URINARY TRACT

SHORT ESSAYS

1	Describe the physiological basis of cystometrogram with a graph	Oct 24
2	With a neat labelled diagram describe the micturition reflex. Add a note on autoregulation of renal blood flow.	Nov 23
3	Describe the mechanism of micturition reflex	May 22

SHORT ANSWERS

4	Draw and label: nerve supply of the urinary bladder and sphincters.	Feb 23
5	Micturition reflex	Feb 22, Aug 12
6	Draw and label a normal cystometrogram	Aug 21, Aug 19 Jul 17, Feb 16, Aug 15, Aug 13
7	Osmotic and pressure diuresis	Nov 20
8	Change in bladder function in spinal shock. Why?	Feb 16
9	Atonic bladder	Mar 12
10	Filling and emptying of urinary bladder	Sep 11

MCQS

11	Deafferentation of urinary bladder produce	Feb 23
12	The role of pudendal nerve in micturition reflex is by controlling.....sphincter	Aug 21
13	The law explaining plasticity of urinary bladder.....	Mar 21

SKIN & TEMPERATURE REGULATION

SHORT ESSAYS

1	Briefly describe the thermoregulatory mechanisms in human body.	Nov 23
2	Describe the regulation of body temperature during hot climate	Jul 17
3	Explain the mechanism of temperature regulation in a cold environment	Feb 13

SHORT ANSWERS

4	Describe the role of hypothalamus in temperature regulation	Oct 24
5	Describe various physiological mechanisms that operate in response to	Jul 24

DECIPHER-I

PHYSIOLOGY-I

6	heat	Jan 24
7	What is Hypothermia. Write one clinical application for hypothermia.	Jan 24
8	Explain the role of skin in regulating body temperature.	Jul 23
9	Shivering is a thermoregulatory response. Why?	Feb 23
10	Mechanism of heat loss by body	Feb 22
11	Hypothermia	Feb 22
12	Skin as thermostat	Mar 21, Nov 20
13	Physiological basis of Hyperthermia	Nov 20
14	Physiological basis of non shivering thermogenesis	Jan 19
15	Reactive hyperthermia	Feb 16
16	Brown fat	Aug 15
17	Hyperthermia	Feb 14
18	Body temperature is slightly elevated during ovulation. Why?	Aug 12
18	Fever during infection	

MCQS

19	An example of fast-adapting sensory receptor -----	Jan 24
20	Normal body temperature	May 23
21	The center regulating temperature in cold environment is located in hypothalamus.	Mar 21

GENERAL QUESTIONS

SHORT ESSAYS

1	Discuss the aspects of verbal and non-verbal communication during patient encounters.	Oct 24
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SHORT ANSWERS

2	Describe the professional qualities of doctor	Oct 24
3	Enumerate the critical components of the doctor-patient relationship.	Jul 24

DECIPHER-I

PHYSIOLOGY-II

PHYSIOLOGY PAPER-II

QUESTIONS

YEAR

GENERAL PHYSIOLOGY

CELL

SHORT ESSAYS

1	Explain the different transport mechanisms across a cell membrane.	May 23
2	Explain the different types of intercellular connections.	Feb 22
3	Inter-cellular communication	Aug 21

SHORT ANSWERS

4	Depict the types of active transport with suitable examples.	Jul 24
5	Describe secondary active transport using an example	Jan 24
6	Draw, label and explain the sodium-potassium pump. What happens if it stops functioning.	Feb 23
7	Active transport	Mar 21, Jan 20
8	Primary active transport	Jul 17
9	Administration of sodium and glucose together in oral dehydration .Why?	Feb 16

MCQS

Multiple response type

10	All of the following are effects of aging 1) Increase in autoimmune disorders 2) Increase in cardiac output 3) Thickening and stiffening of the media of large arteries 4) Decrease in muscle mass and contractile force a) 1, 2 and 3 b) 2, 3 and 4 c) 1,3 and 4 d) 1,2 and 4	Oct 24
11	Facilitated diffusion is a process in which 1) Transport is along the concentration gradient 2) Saturation kinetics is observed 3) Energy (ATP) is required 4) Co transport can occur a) 1, 2 and 3 b) 2, 3 and 4 c) 1,3 and 4 d) 1,2 and 4	Oct 24

old question(1 mark)

12	Normal body temperature	May 23
13	Process of programmed cell death is called	May 22, Feb 22

BODY FLUID COMPARTMENTS AND HOMEOSTASIS

SHORT ANSWERS

1	Describe the mechanisms of Homeostasis with suitable examples	Oct 24
2	With the help of a neat, labelled diagram depict the factors that prevent accumulation of excess fluid in the interstitium	Jul 24
3	Sodium-potassium pump is essential for homeostasis - why?	Jan 24
4	Describe how edema is prevented in a normal body.	Nov 23
5	What is secondary active transport. Explain the types with examples.	Feb 23

6	Physiological basis of Saturation of transportation of substances in facilitated diffusion.	Feb 23
7	Edema in hypoproteinemia .Why?	Aug 12
MCQS		
Multiple response type		
8	Extracellular fluid in adults differs from intracellular fluid in that its 1) Tonicity is lower 2) Lesser volume 3) Anions are mainly inorganic 4) pH is higher a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	Jul 24
old question(1 mark)		
9	Normal value for transport maximum of glucose	Feb 23
10	ECF volume is determined by	May 22, Mar 21

NERVE PHYSIOLOGY AND SKELETAL MUSCLE PHYSIOLOGY

LONG ESSAYS

1	Define synapse. Depict the mechanism of synaptic transmission using a flow chart. Describe the post - synaptic inhibition. Add a note on synaptic plasticity	Nov 23
2	A young female exhibits abnormal fatigability of muscles. Muscular movements, though initially strong, rapidly tire as the day advances or after a vigorous exercise. The symptoms to appear are ptosis, weakness of chewing, swallowing and speaking. She was unable to undertake work above the level of the shoulder. The symptoms showed a remitting course and often were precipitated by emotions, infections and pregnancy. Remarkable recovery was seen after injection of neostigmine intramuscularly. • What is your diagnosis ? • Name the structure involved in this disease. • Describe the structure involved and the normal physiological mechanism of it . • What is the main cause for this condition? • Name any other condition that can affect this structure . • How does injection of neostigmine improve the condition. Describe other drugs which can act at this site.	Aug 21
DIAGNOSIS : MYASTHENIA GRAVIS		
3	A 43-year-old woman complaining of double vision especially for the last 3 months. She has noticed difficulty holding her head up especially in the evenings. Her family noticed that her voice has become quieter. She has lost about 3kg in weight in the past 6 months. The woman has had no significant previous medical illnesses. • What is the diagnosis. ? • What is your plan for investigation and management of this patient. ? • Draw and label neuromuscular junction and describe the neuromuscular transmission.	Mar 21
DIAGNOSIS: MYASTHENIA GRAVIS		

SHORT ESSAYS

4	Describe the molecular basis of skeletal muscle contraction.	Oct 24
5	Describe the functions of sarcotubular system	
6	Discuss the ionic basis for action potential of a nerve fiber	May 23
7	Explain neuromuscular transmission in response to an adequate stimulus to the motor nerve.	Feb 23, Feb 22
8	Describe the molecular basis of skeletal muscle contraction. Add a note on rigor mortis	Feb 23
9	Explain the stretch reflex with the aid of a diagram of the muscle spindle.	Feb 23
10	Diagram of neuromuscular junction. Add a note on neuromuscular blocking drugs.	May 22
11	Explain chronaxie, rheobase and strength duration curve	May 22
12	Resting membrane potential in a neuron and its ionic basis.	Feb 22
13	Excitation -contraction coupling	Sep 21, Aug 15
14	Define chronaxie, rheobase and utilization time. Draw a strength duration curve	Mar 21
15	Explain the steps of neuromuscular transmission	Mar 21
16	Events during neuromuscular transmission of impulse in skeletal muscle	Feb 17
17	Denervation hypersensitivity	Aug 13

SHORT ANSWERS

18	Write the mechanism of action of FOUR chemicals blocking the neuro muscular junction	Oct 24
19	Explain the molecular mechanism of skeletal muscle contraction.	Jul 24
20	Describe the length - tension relationship in skeletal muscles	Jan 24
21	Discuss the differences between red and white muscle fibres	Jan 24
22	Physiological basis for myasthenia gravis	Jan 24, Nov 23
23	Physiological basis of muscle weakness in myasthenia gravis	Jul 23
24	Draw and label muscle spindle	Jul 23
25	Excitation contraction coupling.	May 23
26	Explain the physiological basis of myasthenia gravis	May 23
27	Define chronaxie and rheobase Explain strength duration curve with the help of a diagram	Feb 23
28	Myelinated nerves have higher velocity of conduction compared to unmyelinated nerves why?	Feb 23
29	Draw and label : stretch reflex	May 22
30	With the aid of a diagram explain resting membrane potential.	May 22
31	Classify synapse. Write about the properties of synapses.	Feb 22
32	Explain the ionic basis of resting membrane potential of a nerve fiber.	Feb 22
33	Long term memory is a function of synapse	Sep 21
34	Draw and label :action potential in nerve	Aug 21
35	Describe the properties of skeletal muscle.	Aug 21
36	Draw and label a skeletal muscle action potential and indicate the ionic basis of each part.	Mar 21
37	Physiological basis of myasthenia gravis	Aug 19
38	Physiological basis of Rigor Mortis	

DECIPHER-I

38	Sodium-potassium pump helps to maintain RMP in a neuron .How?	Jan 19
39	Draw and label :Sarcomere in skeletal muscle	Aug 18 , Aug 16
40	Re-polarization phase of action potential	Jul 17
41	Neuromuscular hyper excitability in tetany.Why?	Feb 17
42	Neuromuscular junction in skeletal muscle	Aug 16
43	Absolute refractory period	Feb 16
44	Draw and label :Neuron	Aug 15
45	Tetany	Feb 15
46	End plate potential	Aug 14
47	Excitation-contraction coupling	Aug 14
48	Draw and label :Length-tension relationship in skeletal muscle	Aug 13

MCQS

Multiple response type

49	Saltatory conduction 1) It occurs only in myelinated fibers 2) It does not depend on ionic conduction at the Nodes of Ranvier 3) It has a slower velocity in cold than in warm conditions 4) Transmits impulses with a velocity proportional to fiber diameter a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	Jul 24
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Single response type

50	Contractile unit of the skeletal muscle is a) Sarcomere b) Sarcoplasm b) c) Sarcoplasmic reticulum d) Sarcolemma	Oct 24
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Assertion and reason

51	(A) I band in sarcomere is isotropic to light (R): Length of I band remains the same during muscle contraction a) Both A & R are correct but R is not reason for A b) Both A & R are correct and R is the reason for A c) A is correct R is incorrect d) A is incorrect R is correct	Oct 24
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52	(A): In skeletal muscle, the neurotransmitter released by exocytosis excites the end plate membrane (R): Botulinum toxin facilitates this neuromuscular transmission a) Both A & R are correct and R is the reason for A c) A is correct R is incorrect b) Both A & R are correct but R is not reason for A d) A is incorrect R is correct	Jul 24
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old question(1 mark)

53	Time required for double the Rheobase current to elicit response is called -----	Jan 24
54	Define chronaxie and rheobase Explain strength duration curve with the help of	May 23
55	The part of a neuron in which action potential initiates is.	May 23
56	Degenerative changes in distal part of nerve fiber is called.....	Feb 22
57	Pushing the wall is an example for.....contraction	Aug 21

PHYSIOLOGY-II

DECIPHER-I

58	Minimum strength of current given indefinitely to excite a tissue is called as	Aug 21
59	Glycine is an example of neurotransmitter	Aug 21
60	Compound action potential is produced by....nerve	Aug 21
61	The force of muscle contraction can be increased by.....	Mar 21

CARDIAC MUSCLE

SHORT ESSAYS

1	Enumerate and explain the properties of cardiac muscle	Jan 24
2	Explain the ionic basis of pacemaker potential with the aid of labelled diagram. Mention the changes during sympathetic stimulation	Feb 13

SHORT ANSWERS

3	Cardiac muscle cannot be tetanized.Why?	Feb 16 , Aug 13
4	Prolonged action potential in cardiac muscle.Why?	Feb 14
5	Cardiac muscle action potential	Aug 13
6	Draw and label :Pacemaker potential	Aug 12

SMOOTH MUSCLE

SHORT ANSWERS

1	Latch – Bridge hypothesis	Aug 18
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ENDOCRINE SYSTEM

INTRODUCTION

SHORT ESSAYS

1	Negative feedback mechanisms of hormonal control.	Feb 22
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SHORT ANSWERS

2	What are positive and negative feedback mechanisms. Give examples of each.	Jul 23
3	Mention all the hormones that promote growth of the human body and short answers on each	Feb 23
4	Permissive action of hormone	Feb 22
5	c-AMP as a second messenger	Sep 21
6	Classify hormones. Explain positive feedback.	Aug 21
7	Cyclic AMP acts as second messenger	Aug 16
8	Cyclic GMP acts as second messenger	Feb 16
9	Mode of action of peptide hormone	Aug 15

MCQ

Assertion and reason type

10	(A): Coagulation cascade is an example of negative feedback mechanism (R): In negative feedback, increase in variable triggers the process which decrease the variable to homeostatic level a) Both A & R are correct and R is the reason for A b) Both A & R are correct but R is not reason for A c) A is correct R is incorrect	Oct 24
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PHYSIOLOGY-II

d) A is incorrect R is correct

PITUITARY GLAND**LONG ESSAYS**

- 1 A 55-year-old man came to the medicine department with complaints of headache. On examination he had coarse facial features, enlarged hands and feet and hepatosplenomegaly. His blood sugar was elevated
- Name the most probable clinical condition
 - Physiological basis for his enlarged hands and for the elevated blood sugar
 - What type of visual field defect can occur in this patient. Give its physiological basis
 - Add a note on somatomedins
- 2 List the hormones of the anterior pituitary gland. Describe the actions and control of growth hormone. Explain the consequences of its hyper and hypo secretion

Nov 23

Feb 22

SHORT ESSAYS

- 3 Discuss the hormones influencing growth and the uses of growth chart in assessing progress of growth in different age groups(3+3)
- 4 Actions of hormones of posterior pituitary
- 5 Actions of growth hormone
- 6 Effects of hyposecretion of growth hormone

Oct 24

Mar 21

Jan 20

Jul 17

SHORT ANSWERS

- 7 Physiological basis of onset of puberty
- 8 Describe the actions of vasopressin and add a note on Diabetes Insipidus
- 9 Diabetogenic effect of human growth hormone
- 10 Describe features of acromegaly
- 11 Deficiency of somatomedins in human beings may result in Dwarfism. Why?
- 12 Patients with acromegaly have visual field defects. Why?
- 13 Pituitary dwarfism
- 14 Milk ejection reflex
- 15 Hyper secretion of growth hormone
- 16 Functions of GH
- 17 Physiological actions of growth hormones
- 18 Patients of acromegaly may develop diabetes. Why?

Jan 25

Feb 23

Sep 21

Mar 21

Jan 19

Aug 18

Jan 18, Aug 14

Jan 18, Jul 17,

Feb 17

Feb 17

Feb 17

Feb 14

Aug 13

MCQS**Multiple response type**

- 19 The hormone released from anterior pituitary is
- 1) Follicle-stimulating hormone 2) Prolactin
- 3) Growth hormone 4) vasopressin
- a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4

Oct 24

Assertion and reason type

- 20 (A): Somatomedins are released from hepatocytes
(R): Somatomedins mediate all the metabolic effects of growth

Jul 24

hormone

a) A is correct R is incorrect

c) Both A & R are correct and R is the reason for A

b) Both A & R are correct but R is not reason for A d) A is incorrect R is correct

old question(1 mark)

- 21 Mental retardation occurs in dwarfism due to-----
- 22 Hormone that stimulates milk production in the alveoli of mammary gland -----
- 23 Milk ejection reflex is brought about by-----
- 24 Increased secretion of growth hormone after puberty is called -----
- 25 Site of secretion of somatomedins-----
- 26 Acromegaly is due to hypersecretion of.....in adults

Jan 24

Jan 24

Feb 23

Feb 23

May 22

Feb 22

THYROID GLAND**LONG ESSAYS**

- 1 A 52-year-old housewife complains of progressive weight gain of 10 kg in 1 year, fatigue, loss of memory, slow speech, deepening of her voice, dry skin, constipation, and cold intolerance. On examination her pulse was 58 beats/min, she was moderately obese with a puffy face, non-pitting edema on the lower limbs, the Thyroid gland appeared enlarged, and deep tendon reflexes were delayed.
- What is the patient suffering from
 - What blood investigations should be done to confirm the diagnosis
 - Describe the biosynthesis and functions of the hormone causing this disorder
- 2 A patient with parathyroid hormone deficiency 10 days after inadvertent damage to parathyroid glands during thyroid surgery. Answer the following questions
- Explain the mechanisms underlying two clinical signs of parathyroid hormone deficiency.
 - Describe the physiological actions of parathyroid hormone.
 - Mention the normal blood calcium level and add a note on significance of intracellular calcium.
- 3 A 50 years old lady was suffering from excess of sleep and tiredness, loss of appetite, hoarseness of voice for the last six months. On examination, she had non pitting edema, dry scaly skin and prolonged reflex time. Answer the following questions based on your knowledge in physiology
- What is your clinical diagnosis?
 - What will be the TSH, T3 and T4 levels?
 - What is the cause of low BMR?
 - How can you treat the subject?
 - What will be the resting pulse rate and ECG wave complex?
 - Explain the action of thyroxine on the three metabolisms and CNS.

Jul 23

Nov 20

Aug 16

DIAGNOSIS : HYPOTHYROIDISM

DECIPHER-I

4	A young woman has puffy skin and hoarseness of voice. Her plasma TSH concentration is low. Answer the following questions based on your knowledge in physiology: • Explain the physiological basis of her symptoms. • Describe the mechanism of action of thyroid hormones. • Explain the regulation of its synthesis. • What are its effects on nervous system?	Feb 16	PHYSIOLOGY-I
5	A 30 years female with features of increased weight, menstrual abnormalities, cold intolerance. Answer the following questions based on your knowledge in physiology: • Name the probable condition with its cause. • What are the physiological actions of hormone related to this condition? • Mention the tests for diagnosing this condition.	Feb 15	PHYSIOLOGY-I
DIAGNOSIS : HYPOTHYROIDISM			
SHORT ESSAYS			
6	Describe the functions of Thyroid hormone. Write the physiological basis for cretinism	Nov 23	
7	Describe the synthesis of thyroid hormones. Explain their physiological actions and add a note on hypo secretion of thyroid hormones.		
8	Actions of parathormone.	Sep 21	
9	Graves disease	Aug 19	
SHORT ANSWERS			
10	Describe the physiological basis of cretinism.	Jul 24, May 23	
11	Physiological basis of Mental retardation in cretinism	Jan 24	
12	Any two characteristic features and their physiological basis of hypothyroidism in a 30- year old woman	May 22	
13	Calorigenic action of thyroxin	Feb 22	
14	Cretinism	Sep 21, Aug 18	
15	Physiological basis of goitre	Mar 21	
16	List clinical features of cretinism	Nov 20	
17	Steps of thyroid hormone synthesis	Jan 19	
18	Draw and label :Feedback regulation of thyroid hormone secretion	Feb 17	
19	Feedback regulation of thyroid hormone secretion	Aug 14	
20	Draw and label :Mechanism of action of thyroid hormone on intracellular receptor	Mar 12	
MCQS			
clinical scenario based			
21	A 40-year-old female patient complains of excessive sweating, weight loss and muscle weakness for the past three months. The patient also complains of inability to sleep & extreme fatigue. On examination, the physician found a heart rate of 100 beats/ minute and fine tremors in the hands. i. Which of the following statements are TRUE about the above	Oct 24	

DECIPHER-I

clinical condition		PHYSIOLOGY-II
a)	Mostly due to autoantibodies against TSH receptor	
b)	Toxic adenomas are the most common cause	
c)	There is a transient decrease in thyroid hormone	
d)	The patient will have cold intolerance	
ii.	The mineral essential for the normal biosynthesis of thyroid hormone is.....	
a)	Iron	b) Iodine
c)	Zinc	d) Selenium
iii.	The most accurate diagnostic test the physician would suggest to confirm his diagnosis is the measurement of	
a)	Thyroid-stimulating hormone	
b)	Thyroid stimulating immunoglobulins	
c)	Tri-iodothyronine	
d)	Free thyroxine	
iv.	The muscle weakness in this condition is due to increased	
a)	Synaptic excitability	b) Neuronal hyperexcitability
c)	Protein catabolism	d) Glucose breakdown
v.	Deficiency of the thyroid hormone results in the following effects on female reproductive function	
a)	Amenorrhoea	b) Menorrhagia
c)	Oligomenorrhoea	d) Normal menstrual cycle
Assertion and reason type		
22	(A): Hyposecretion of thyroid hormone in children leads to cretinism (R): Lack of iodine in mother causes thyroid-gland hyposecretion in pregnancy a) A is incorrect R is correct b) Both A & R are correct but R is not reason for A c) A is correct R is incorrect d) Both A & R are correct and R is the reason for A	Oct 24
old questions (1 mark)		
23	Edema in hypothyroidism is due to the accumulation of	Nov
24	The condition in which carpopedal spasm seen is	May
25	Yellowish tint of skin in myxoedema is due to.....	Feb
CALCIUM AND PHOSPHATE HOMEOSTASIS		
LONG ESSAYS		
1	What is the normal serum calcium level. Describe the calcium homeostasis in our body. Describe the physiological basis for tetany.	Jul
2	Describe the regulation of serum calcium with the mechanisms involved. Write the physiological basis for tetany in hypocalcemia. List the causes and clinical features of hypercalcemia.	J
SHORT ESSAYS		
3	Name the hormones which affect serum calcium level. Describe their mode of action	

DECIPHER-I

SHORT ANSWERS

5	Describe the regulation of blood calcium level	Jan 24
6	Hormones regulating calcium homeostasis	Mar 21

MCQS

Single response type

7	Carpopedal spasm is a clinical feature of a) Acromegaly b) Tetany c) Cretinism d) Dwarfism	Oct 24
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old question(1 mark)

8	Normal blood Calcium level is	Nov 23, Feb 23
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ADRENAL GLAND

LONG ESSAYS

1	A 42-year-old female patient presented with hirsutism, purple striae on the skin, buffalo hump and visual field defect. Her serum cortisol was elevated. a) Name the most probable clinical condition b) Describe the regulation of cortisol c) What type of visual field defect occurs in this patient and why d) Describe the physiological basis for the buffalo hump and purple striae.	Oct 24
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2	A 40-year old female patient reported that she was feeling very weak Her legs were thin but abdomen, upper back and face were full with deposition arms and of fat. She had also noticed that minor injuries were resulting in bruises and taking a long time to heal Reddish purple striations were seen in the skin of her abdomen. Her blood pressure was 180/100 mmHg, pulse rate was 99/min • Identify the condition. • Discuss the physiological basis for the above condition • Discuss the physiological and pharmacological actions of glucocorticoids	May 23
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3	A 33 years old woman complained of weight gain. Round face, thinning of her limbs and increased bruising of skin with discoloration on her prominent abdomen. Answer the following questions based on your knowledge in physiology: • What is the probable endocrinological disorder? • What investigations are needed for confirmation of the diagnosis and follow up ? • Mention the major manifestations and their physiological basis.	Aug 15
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DIAGNOSIS : CUSHING SYNDROME

SHORT ESSAYS

4	Explain the anti-inflammatory and immunosuppressive actions of cortisol. Add a note on Cushing's syndrome	Jul 24
5	Describe the physiological actions of glucocorticoids. List the features of Cushing's syndrome.	Jan 24
6	Describe the functions of aldosterone. Explain aldosterone	Aug 21

PHYSIOLOGY-II

DECIPHER-I

escape. Add a note on Conn's syndrome.

7	Role of mineralocorticoids in salt and water balance	Jan 18
8	Describe the regulation of secretion of cortisol and its physiological role	Jul 17
9	Role of aldosterone in maintaining ECF sodium concentration	Aug 12

SHORT ANSWERS

10	Soldiers do not feel the pain of their injury until the battle is over – why?	Jan 24
11	Edema is not a feature of primary hyper aldosteronism. Why?	Nov 23
12	Compare and contrast the functions of epinephrine and nor-epinephrine. Add a note on pheochromocytom	Feb 23
13	Mechanism of action of steroid hormone	Sep 21
14	Name the glucocorticoids and mention its functions	Mar 21
15	Permissive action of glucocorticoids	Jan 18
16	Action of ADH	Jul 17
17	Aldosterone escape phenomenon	Feb 16
18	Adrenogenital syndrome	Aug 15
19	Difference between adrenaline and nor adrenaline	Feb 15
20	Pigmentation in Addison's disease .Why?	Aug 14 , Feb 14
21	Cushing's syndrome	Aug 12
22	Glucocorticoids in stress .Why?	Mar 12

MCQS

Multiple response type

23	In a typical "fight or flight response," there will be 1) Dilatation of pupils 2) Tachycardia 3) Vasoconstriction 4) Hypotension a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	Jul 24
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old question(1 mark)

24	Antidiuretic hormone acts on ----- cells of the nephron	Jan 24
25	Disorders due to the hypersecretion of glucocorticoids is called ----	Nov 23
26	Adrenal medullary hormones belong to a chemical class of...	May 23
27	Cushing's syndrome is due to hypersecretion of --	Feb 23
28	Adrenal cortical insufficiency leads to a condition...	Feb 22

ENDOCRINE PANCREAS

LONG ESSAYS

1	A 55 year old women comes to the medicine department with history of increased frequency of nocturnal urination with increased thirst and hunger, investigation revealed her HbA1c to be 8 and fasting blood sugar was 280mg/dl • What is your probable diagnosis • Discuss the physiological basis of her complaints • List all the hormones responsible for glucose homeostasis	Jan 24
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DECIPHER-I

PHYSIOLOGY-II

- 2 A 45-year-old casual labourer comes to the OPD with complaints of excessive thirst, urination, hunger and weakness. Of two weeks' duration with your knowledge of physiology, answer the following.
- What is the most likely condition.
 - What tests would you suggest to confirm.
 - How can you explain his symptoms.
 - What are the dietary and lifestyle modifications you would suggest for this man.

May 22

DIAGNOSIS: DIABETES MELLITUS

- 3 A 50 year old diabetic was brought to the hospital complaining of severe breathlessness. His breath had a fruity odour and respiratory rate was 30 per minute. His blood sugar was 375 mg% and plasma pH was 7.2. Answer the following questions based in your knowledge in physiology.

Aug 18

- What is the most likely diagnosis?
- What is the most important medication that should be administered immediately?
- Name two abnormal substances that might be present in his urine.
- What is the physiological explanation for his plasma pH value and fruity odour breath?

DIAGNOSIS : DIABETIC KETOACIDOSIS

- 4 A 50 years old person complaints of increased appetite, increased thirst and increased frequency of urination, the blood glucose was found to be 180mg/dl. Answer the following questions based on your knowledge in physiology:

Jul 17

- What is your probable diagnosis?
- Which hormone is affected?
- What are the physiological effects of this hormone in the body?
- Enumerate the other hormones involved in the regulation of blood glucose.

DIAGNOSIS : DIABETES MELLITUS

SHORT ESSAYS

- 5 Describe the actions of insulin. Write the physiological basis for polyphagia, polydipsia and polyuria in diabetes mellitus
- 6 Describe the mechanism of action of insulin and its functions. Add a note on clinical signs and symptoms of diabetes mellitus. Explain glucose tolerance test curve
- 7 Metabolic effects of insulin

Jan 24, Nov 23

Aug 21

Aug 13

SHORT ANSWERS

- 8 Renal threshold for glucose and glycosuria in diabetes mellitus.
- 9 Physiological basis of polyuria in diabetes mellitus
- 10 Diabetes insipidus
- 11 Polyphagia of diabetes mellitus
- 12 Polyuria and polydipsia in diabetes insipidus
- 13 Composition of pancreatic juice

Jan 24

Jul 23

Feb 23, Feb 22, Aug 19

Feb 22

Feb 22, Sep 21

Sep 21

DECIPHER-I

PHYSIOLOGY-II

- 14 Functions of glucagon
- 15 Presence of insulin is needed for glucose entry into the skeletal muscle. Why?

Jan 20

Jan 20

- 16 Physiological actions of glucagon on carbohydrate metabolism

Mar 12

MCQS

- 17 The most abundant cell type in the islets of Langerhans is

May 22

PINEAL GLAND

MCQS

- 1 Name the hormone secreted by the pineal gland

Nov 23

REPRODUCTIVE SYSTEM

SEXUAL DEVELOPMENT IN EMBRYO

SHORT ANSWERS

- 1 Differentiate between turner's syndrome and Klinefelter's syndrome

May 22

MALE REPRODUCTIVE SYSTEM

SHORT ESSAYS

- 2 Explain the functions of testosterone during fetal period, puberty and in adults
- 3 Describe the physiological actions and control of testosterone secretion
- 4 Describe the functions of testosterone in foetal and adult life. What is cryptorchidism.
- 5 Describe about spermatogenesis and the hormonal factors regulating it

Oct 24

Feb 22

Aug 21

Aug 18, Feb 14

SHORT ANSWERS

- 6 Steps of spermatogenesis
- 7 Enumerate the functions of androgens during puberty.
- 8 What is testosterone. Describe two important actions of this hormone.
- 9 Sterility in man working in hot surroundings Why?
- 10 Anemia in hypogonadism of male. Why?
- 11 Capacitation of sperms
- 12 Spermatogenesis is markedly reduced in undescended testis. Why?
- 13 Physiological basis of blood testis barrier
- 14 Castration before puberty .Why?
- 15 Undescended testis
- 16 Testosterone
- 17 Functions of testosterone
- 18 Steps of spermatogenesis and list the hormones involved
- 19 Hormones regulating spermatogenesis

Jan 24

Jul 23

Feb 23

Feb 22

Sep 21

Nov 20

Jan 20

Aug 19

Jan 18

Feb 17

Aug 16

Feb 15

Aug 14

Mar 12

Nov 23, May 22

Jan 24, May 23

MCQS

- 20 The cell involved in blood testis barrier is
- 21 Cells of testis that secrete testosterone is
- 22 Decrease in sperm count is called

Feb 23

FEMALE REPRODUCTIVE SYSTEM

SHORT ESSAYS

1	Describe the changes that occur in the uterine endometrium during the menstrual cycle with the hormonal basis	Jul 24
2	Describe the ovarian changes in menstrual cycle and the hormones regulating it (5+3)	Nov 23
3	Describe endometrial changes that occur during a normal menstrual cycle. Name the hormone responsible for each phase.	May 23
4	Describe the hormonal regulation of menstrual cycle. Add a note on menopause	Feb 23
5	Describe any five functions of oestrogen	Nov 20
6	Describe hormonal and endometrial changes during menstrual cycle	Jan 20, Aug 14
7	Ovarian changes during a normal menstrual cycle	Feb 16
8	Ovarian cycle	Feb 15
9	Tests for ovulation	Aug 12

SHORT ANSWERS

10	Physiological basis of menopause	Oct 24, Jul 23
11	Draw and label : Hormonal and uterine changes in menstrual cycle	Feb 23, Mar 21
12	Describe secondary sexual characteristics in females	Mar 21
13	Menstrual blood does not clot. Why?	Jan 20
14	Physiological basis of menopause	Aug 19
15	Draw and label : Hormonal changes during a normal menstrual cycle	Jan 19
16	Functions of progesterone	Jan 19
17	Corpus luteum of menstruation and pregnancy	Jan 18
18	Ovarian cycle	Aug 13
19	Functions of oestrogen	Aug 12

MCQS

Single response type

20	In what way does the 21st day of the menstrual cycle differ from the seventh day a) Thin endometrium b) Low endometrial glycogen c) High plasma progesterone level d) High plasma FSH level	Jul 24
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Assertion and reason type

21	(A): Luteinizing Hormone (LH) surge results from negative feedback effects by estrogen (R): LH surge is necessary for ovulation a) Both A & R are correct and R is the reason for A c) A is correct R is incorrect b) Both A & R are correct but R is not reason for A d) A is incorrect R is correct	Jul 24
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old question(1 mark)

22	The phase of menstrual cycle occurring after ovulation is called.....	Aug 21
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FERTILIZATION AND PREGNANCY

LONG ESSAYS

1	A married female aged 25 years has history of amenorrhea for 3	Jan 19
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- months, she has morning sickness.
- What is your diagnosis?
 - Describe one test to confirm your diagnosis.
 - Describe the relevant changes that occur to this female.
 - Add a note on feto-placental unit.

DIAGNOSIS : PREGNANCY

SHORT ESSAYS

2	Functions of placenta	
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SHORT ANSWERS

3	Draw and label the feto-placental unit. Describe its significance.	Jul 23, May 22
4	Describe parturition	Jul 24
5	Functions of hCG	Mar 21
6	Immunological test of pregnancy	Aug 19
7	Physiological basis of pregnancy tests	Jul 17
8	Functions of placenta	Aug 16
9	Tests of ovulation	Feb 14
		Mar 12

MCQS

Single response type

10	A 27 year old married woman having regular menstrual cycles does not have her periods for past 10 weeks. The gynaecologist suggests her to go for a urine pregnancy test. The following hormone in urine a pregnant woman forms the basis of pregnancy test a) Human chorionic gonadotropin * b) Estrogen c) Inhibin d) Human chorionic somatomammotropin	Oct 24
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old question(1 mark)

11	Detection of pregnancy is based on hormone	Feb 22
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LACTATION

SHORT ANSWERS

1	Milk ejection reflex	Jan 20, Jan 18 Jul 17, Feb 17
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CONTRACEPTION AND INFERTILITY

SHORT ESSAYS

1	List the contraceptive methods in females. Describe the physiological basis for any two of them	Jan 24
2	Female contraception	Aug 19

SHORT ANSWERS

3	Physiological basis of intra uterine devices (IUCD)	Jan 24, Nov 23
4	Physiological basis of Oral Contraceptives	Feb 23
5	Methods of contraception in the woman	Feb 22
6	Safe period of family planning in females.	Sep 21
7	Safe period	Mar 21, Feb 17, Aug 15
		Nov 20
8	Physiological basis of Copper-T	Jan 20, Aug 16
9	Contraception by oral contraceptive pills	Aug 14, Mar 12

DECIPHER-I

10	Intra-uterine contraceptive devices preventing pregnancy	Feb 14, Aug 13
11	Lactation amenorrhea	Aug 12
MCQS		
12	Permanent method of sterilization in females is...	Feb 23
13	Permanent method of sterilization in males is...	Aug 21

NERVOUS SYSTEM

INTRODUCTION

SHORT ESSAYS

1	Mechanism of synaptic transmission	Jan 18
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MCQS

2	Neurotransmitter secreted at the Autonomic ganglia is	May 23
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PHYSIOLOGY OF NERVOUS SYSTEM

SHORT ESSAYS

2	List the different types of inhibition. Explain Renshaw cell inhibition	Mar 21
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SHORT ANSWERS

2	Draw and label nerve action potential in relation to ionic fluxes	Nov 20
3	Presynaptic inhibition	Aug 19
4	Reciprocal innervations	Feb 17
5	Renshaw cell inhibition	Feb 17
6	Draw and label: Neuromuscular junction in skeletal muscle	Jul 17

REFLEX ACTION

SHORT ANSWERS

1	Draw the diagram of stretch reflex arc	Feb 22
2	Draw the diagram of Inverse stretch reflex pathway	Feb 22
3	Myotatic reflex	Aug 19
4	Pyramidal tract lesions produces exaggerated deep tendon reflexes. Why ?	Jan 19
5	Reciprocal innervation	Mar 12
6	Draw and label: Muscle spindle	Aug 18, Jul 17
7	Draw and label: Stretch reflex and inverse stretch reflex	Aug 12

MCQS

8	The receptor for inverse stretch reflex is.....	May 22, Aug 21
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SENSORY DIVISIONS OF NERVOUS SYSTEM AND SENSORY PATHWAYS

LONG ESSAYS

1	A 15 year old boy presents with sudden onset of severe pain around the umbilicus, radiating to the right iliac fossa. He also has fever and nausea. a) Explain any two theories that explain the basis of this type of pain. b) Explain the pathways of pain with a neat labelled diagram. c) Explain the supraspinal analgesia mechanism that modulates pain perception	Jul 24
2	An elderly man was admitted to the hospital with complaints of intense central chest pain with radiation to left arm. Answer the following questions based on your knowledge in physiology	Feb 17

DECIPHER-I

- What is the cause of the pain in the left arm and explain its mechanism ?
- Describe the pain pathway in detail.
- Mention gate control theory of pain sensation.

DIAGNOSIS : REFERRED PAIN

SHORT ESSAYS

3	Draw and label the pathway for fast pain from the right lower limb. Describe the supra spinal modulation of pain (4+4)	Nov 23
4	With the aid of a diagram describe the pain pathway from right lower limb.	Feb 23
5	Explain theories of pain and give two examples	Mar 21
6	Gate control theory of pain	Aug 15

SHORT ANSWERS

7	Pain of Myocardial Infarction (MI) can be felt on the left upper arm	Jan 24
8	Two - point discrimination is better on the finger tips than on the back. Why	Nov 23
9	Draw and label: Pain pathway.	Jul 23
10	Draw and label the Dorsal column pathway from right lower limb.	May 22
11	One example for lateral inhibition.....	May 22
12	Explain the physiological basis of referred pain.	Feb 22
13	Endogenous peptide produces analgesia	Feb 22
14	Draw and label: Lateral spinothalamic tract	Mar 21
15	Physiological basis of referred pain	Mar 21, Nov 20
16	Law of projection	Jan 19
17	The pain of an injury is felt more after the game by a player. Why?	Aug 18
18	Referred pain	Jan 18
19	Supra spinal modulation of pain	Jan 18
20	Draw and label: Antero lateral system	Feb 16
21	Draw and label: Pathway of crude touch	Feb 15
22	Draw and label: Pain pathway from origin to termination	Feb 14
23	Pain disappears by rubbing the affected area. Why?	Aug 13
24	Diaphragmatic pain is felt at the tip of the shoulder Why?	Aug 13
25	Patients with sensory ataxia lose balance on closing their eyes. Why?	Mar 12
26	Draw and label: Posterior column tract	

MCQS

Multiple response type

27	The sensation carried by dorsal column are 1) Pain 2) Vibration 3) Fine touch 4) Proprioception a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	Oct 24
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Assertion and reason type

28	(A): Pain due to the inflammation of appendix felt around the umbilicus is an example for referred pain (R): One-way condition is a property of synapse a) Both A & R are correct and R is the reason for A b) Both A & R are correct but R is not reason for A c) A is correct R is incorrect d) A is incorrect R is correct	Oct 24
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old question(1 mark)		Feb 22
29	The motor speech centre isarea	Aug 21
30	In spinal cord the dorsal root is sensory and the ventral root is motor, this law is called.....	

THALAMUS

SHORT ESSAYS		Feb 16
1	Describe connections and functions of thalamus	

SHORT ANSWERS		Oct 24
2	Describe the physiological basis for phantom limb pain	Jan 18, Aug 15
3	Thalamic phantom limb	Aug 15
4	Functions of thalamus	

MOTOR DIVISIONS OF NERVOUS SYSTEM

LONG ESSAYS		Feb 22
1	A patient complaints of difficulty in walking, talking and not able to perform rapid alternate movements. Answer the following questions based on your knowledge in physiology: • Which part of brain is affected • Enumerate the other manifestations of this lesion • Describe the functional connections and functions of the part affected	
2	• Describe the origin, course and termination and functions of cortico-spinal tract. • Add a note on hemiplegia. • List the differences between upper motor neuron and lower motor neuron lesions	Aug 21
3	A 55 year old man, known hypertensive comes to emergency department with altered consciousness and weakness of right side of the body. On examination there is increased muscle tone in the right upper and lower limbs, exaggerated deep tendon reflexes and absent superficial reflexes. • What is he suffering from ? • What are the differences between UMN and LMN lesions ? • What is Babinski's sign? • What are the physiological and pathological causes of Babinski's sign ?	Mar 21
DIAGNOSIS : UMN LESION DUE TO STROKE		
4	A 60 years old known hypertensive male is admitted with the complaints of sudden inability to use his right upper and lower limbs and inability to speak. On examination he has increased tone in some of the limb muscles loss of superficial reflexes and deep tendon reflexes are exaggerated. Answer the following questions based on your knowledge in physiology: • What is this clinical condition? • Draw the diagram of the tract involved . • Why there is an increase in the tone of the muscle? • Why speech is lost in this condition ?	Jan 20
DIAGNOSIS : UMN LESION DUE TO STROKE		

5	Draw a diagram to show the origin, course and termination of Cortico spinal tract	Mar 21
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SHORT ANSWERS

6	Describe the degenerative changes that occur following peripheral nerve injury.	
7	Draw and label Dorsal column pathway	Jan 24
8	Physiological basis of hypertonia in UMN lesion	Jul 23
9	Compare the Upper Motor Neuron (UMN) and Lower Motor Neuron (LMN) lesions	Nov 23
10	Draw and label pyramidal tract	Nov 20, Aug 19
11	Babinski sign	Nov 20
12	Draw and label: Corticospinal tracts from its origin to termination	Aug 16, Aug 14

MCQS**Clinical scenario based**

13	A 70 year old male was admitted to hospital with chief complaints of right sided generalised weakness for 2 days. He is a known hypertensive for the past 10 years on irregular treatment. On examination his vitals were stable. He had signs of upper motor neuron lesion. His Computed tomography (CT) of brain revealed a massive haemorrhagic lesion at the level of internal capsule. Answer the following questions based on the given case scenario 1) Upper motor neuron in Central Nervous System means a) Axons of any neuron arising from the spinal cord b) Motor neuron supplying the muscle c) Motor neuron above level of the anterior horn cell d) Motor neuron below level of the anterior horn cell 2) Most commonly affected artery a) Middle cerebral artery b) Posterior cerebral artery c) Anterior cerebral artery d) Anterior spinal artery 3) The major descending tract that brings about skilled voluntary movements a) Rubro spinal tract b) Tectospinal tract c) Anterior corticospinal tract d) Lateral corticospinal tract 4) The following are signs of Upper Motor Neuron lesion (UMN) EXCEPT a) Flaccidity of affected muscles b) Spasticity of affected muscles c) Exaggerated reflexes in the affected motor segments d) Decreased strength of affected muscles 5) Pyramid in medulla is formed by decussation of a) Spinothalamic tract b) Corticospinal tract c) Spinocerebellar tract d) Rubrospinal tract	Oct 24
old question(1 mark)		
14	Babinski sign is positive in	May 23

15

LONG ESSAYS

- 1 A 35-year-old man was brought to the casualty after a stab injury to the left side of his back. Imaging study showed injury to left half of spinal cord in region of 9th and 10th thoracic vertebrae. Neurological examination showed that he was unable to move his left lower limb. Some sensations were absent on the left half of the body while some other sensations were absent on the right side. On the left side the abdominal reflex was absent, but knee and ankle jerks were brisk.
- Name the most probable clinical condition in this patient.
 - Explain the physiological basis for the typical sensory loss in this patient.
 - Describe the sensory and motor changes occurring at the level and below the level of injury in such cases.
 - Describe the theories of referred pain using an example

Jan 24

- 2 Describe brown sequard syndrome. With the help of a diagram explain the nervous system involvement in this disease

May 22

SHORT ESSAYS

- 3 Describe the effects of complete transverse section of spinal cord.

Feb 22

SHORT ANSWERS

- 4 Draw and label the dorsal column path way

Oct 24

- 5 Brown-Sequard syndrome

Aug 18, Aug 15, Feb 15

- 6 Upper motor neuron lesions produce hypertonia Why?

Aug 18

- 7 Abnormal plantar reflex in neurological diseases Why?

Aug 16

- 8 Babinski's sign in new born .Why?

Aug 15

- 9 Lumbar puncture is done at L2-L3 level .Why?

Feb 14

MCQ

multiple response type

- The characteristic features of the upper motor neuron type of paralysis are

Jul 24

- 1) Spastic paralysis 2) Hypotonia
3) Extensor plantar response
4) Exaggerated deep tendon reflexes

- a) 1, 3 and 4 b) 2, 3 and 4 c) 1, 2 and 3 d) 1, 2 and 4

Single response type

- What is the likely clinical feature below the level of the lesion in right hemi-section of the spinal cord at C7 level
- a) Loss of pain sensation in the right leg
c) Loss of conscious proprioception in left leg
b) UMN paralysis in the right leg
d) Respiratory failure

Jul 24

Assertion and reason type

- (A): Tabes dorsalis is characterized by loss of joint position sense

Jul 24

- (R): The loss of joint sense in tabes dorsalis is due to bilateral degeneration of posterior nerve roots.
- a) Both A & R are correct and R is the reason for A c) A is correct R is incorrect
b) Both A & R are correct but R is not reason for A d) A is incorrect R is correct

BASAL GANGLIA OR BASAL NUCLEI

LONG ESSAYS

- 1 A 69-year-old man goes to consult his physician. As he sits in the waiting room, he is observed to have tremors in his hands and fingers. His face is unexpressive and he makes few movements. When he is invited to enter the physician's office, he has difficulty in standing up. He walks slowly into the office, and his arms do not swing appreciably. When he talks to the physician, his speech is monotonous but he shows no intellectual deficit. There was no sensory loss. The stretch reflexes were normal and the muscles exhibited rigidity.
- What is your diagnosis
 - Which part of the nervous system is involved in this disease
 - Explain the connections and functions of the part of the nervous system involved.
 - Why are the movements so few and slow
 - What is the treatment

Feb 23

- 2 A 69-year-old man went to consult his physician. He had tremors in his hands and fingers. His face was unexpressive. When he was invited to enter the physician's office, he had difficulty in standing up. He walked slowly into the office. There was no sensory loss. The stretch reflexes were normal and the muscles exhibited rigidity.
- Identify this condition
 - Discuss the physiological basis of this condition
 - Describe the connections of basal ganglia
 - Discuss the functions of basal ganglia

Feb 22

- 3 A 71 years old retired teacher presented with complaints of difficulty to start walking and tremor of hands. His wife often found his face "expressionless". Answer the following questions based on your knowledge in physiology:
- Name the commonest clinical condition causing the above complaints
 - Diagrammatically represent the structure involved and its functional connections
 - Enumerate its functions
 - Briefly mention the physiological basis of treatment of this disease

Sep 21

- 4 Important findings on examination include decrease in power in all muscle groups. Tone, coordination, reflexes and sensation are

Mar 21

normal. Bilateral ptosis is present and is exacerbated by prolonged upward gaze. Pupillary reflexes, eye movements and fundoscopy are normal. Speech becomes soft when the patient is tired. Symptoms are usually worse in the evenings and better in the mornings.

- What are the connections and functions of Basal ganglia. ?
- Add a note on Parkinsonism.

5	A 45 years old automobile mechanic is not able to perform his professional work and is complaining of tremor during rest and unable to initiate a movement. He always takes short quick steps while walking. Answer the following questions based on your knowledge in physiology:	Aug 19
	• What can be the probable condition? • Explain the pathophysiology underlying it. • What are the functions of the structure affected? • Suggest the probable methods of treatment for this condition.	
DIAGNOSIS: PARKINSONISM		

SHORT ESSAYS

6	Explain the basis of clinical features of Parkinsonism with the help of basal ganglia circuits.	Jul 24
7	Connections and functions of basal ganglia	Mar 12

SHORT ANSWERS

8	Explain the physiological basis of Parkinson's disease.	May 23
9	Short answer on Parkinsonism.	Feb 23
10	Administration of L-dopa in Parkinson's disease .Why?	Jan 18, Aug 14
11	Cogwheel rigidity	Jul 17
12	A 50 year old lady finds difficulty in reading and doing close work. Why?	Aug 16
13	Clasp knife rigidity	Aug 14
14	Parkinsonism	Aug 13

MCQS**Multiple response type**

15	Signs of Parkinsonism in humans include 1) Intention tremor 2) Hypokinesia 3) Cogwheel rigidity 4) Festinant gait a) 1, 2 and 3 b) 2, 3 and 4 c) 1,3 and 4 d) 1,2 and 4	Oct 24
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Old questions(1 mark)

16	Intention tremor is seen in	Feb 23
17	Kernicterus is caused due accumulation of --- in the basal ganglia.	Feb 22

CEREBELLUM**LONG ESSAYS**

1	Explain the connections and functions of cerebellum. Add a note on clinical symptoms seen in cerebellar lesions	May 23
2	A 65 years old woman was admitted to the hospital with the complaints of intentional tremors in the left arm and missing the	Jan 18

target when he attempted to do a work. On examination eye reveals nystagmus. Answer the following questions based on your knowledge in physiology:

- What is the diagnosis ?
- Mention the characteristic of knee jerk in this patient.
- What is dysdiadochokinesia?
- Describe the gait in this patient giving the physiological basis .
- What happens when flocculonodular lobe is damaged?

DIAGNOSIS : CEREBELLAR ATAXIA**SHORT ESSAYS**

3	Describe the physiological basis for any three features of cerebellar disorders (2+2+2)	Oct 24
4	Describe the functions of cerebellum. List the clinical features of cerebellar dysfunction	Jan 24
5	Connections and functions of cerebellum	Jan 24, Jan 19
6	Draw the functional divisions of cerebellum. Explain the functions of these divisions with referring to their connections	Aug 16
7	Functions of cerebellum	Feb 15

SHORT ANSWERS

8	Dysdiadochokinesia (Adiadochokinesia)	Sep 21
9	Functions of cerebellum	Nov 20 , Jan 20 , Aug 18
		Feb 17
10	Cerebellum in voluntary activity	Aug 13
11	Role of the cerebellum in motor control	Aug 13
12	Features of cerebellar lesions	Aug 12
13	Broad based gait in cerebellar lesion .Why?	

MCQS

14	Disdiadochokinesia is a feature of ----- disorder	Nov 23
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VESTIBULAR APPARATUS**SHORT ANSWERS**

1	Physiological basis of vestibulo ocular reflex	Nov 20
2	Nystagmus is observed in vestibular disease.Why?	Aug 16

CEREBRAL CORTEX**LONG ESSAYS**

1	A 61 year old Senior Lawyer (male) in a law firm, while eating breakfast experienced sudden onset slurring of speech, and had facial droop on his left-hand side with weakness in his left side upper and lower limbs. His wife spotted these sudden onsets of symptoms and immediately called for an ambulance, which arrived within 15 mins and rushed him to the Emergency room of a hospital. a) What is the patient suffering from b) What examination and investigations should be done to confirm the diagnosis c) Describe the functions and connections of the pathway affected with a neat, labeled diagram	Feb 23
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DIAGNOSIS: LEFT SIDED STROKE (HEMIPLEGIA)

SHORT ANSWERS

2	Draw and label lateral view of cerebral hemisphere and mark the speech areas	Jan 20
3	Functions of parietal lobe of brain	Feb 16
4	Sensory homunculus	Aug 14
5	Aphasia	Feb 14
6	Draw and label :Functional areas of cerebral cortex	Feb 14

MCQ

Single response type

7	Impairment of moral and social senses and flight of ideas occur in a) Temporal lobe lesions b) Parietal lobe lesions c) Occipital lobe lesions d) Prefrontal lobe lesions	
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HYPOTHALAMUS

SHORT ESSAYS

1	Explain the functions of the hypothalamus.	Jul 23
2	Name the nuclei of hypothalamus. Enumerate the functions of hypothalamus and describe any one in detail	Feb 14
3	Describe the role of hypothalamus in the regulation of food intake	Mar 12

SHORT ANSWERS

4	Explain the role of the hypothalamus in the regulation of food intake.	Jul 24
5	Functions of hypothalamus	Sep 21
6	Hypothalamic disorders results in obesity .Why?	Jan 19
7	Role of hypothalamus in feeding behaviour	Jul 17
8	Role of hypothalamus in temperature regulation	Aug 16

MCQS

9	Hypothalamic nucleus responsible for heat generation is -----	Nov 23
10	Bilateral destruction of ventromedial nucleus of hypothalamus results in -----	Feb 22

POSTURE AND EQUILIBRIUM

SHORT ANSWERS

1	Decerebrate rigidity	Feb 22
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LIMBIC SYSTEM

SHORT ANSWERS

1	Functions of limbic system	Feb 14
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ELECTROENCEPHALOGRAPHY ,SLEEP,YOGA AND MEDITATION

SHORT ANSWERS

1	Describe the waves and uses of Electro Encephalogram (EEG)	Oct 24
2	How does REM sleep differ from Non REM sleep	Mar 21
3	Types of EEG wave forms	July 17, Jan.19
4	Paradoxical sleep	Feb.17
5	Mention the stages of sleep	Feb 15

MCQS

6	Disappearance of alpha waves in EEG while opening the eyes is called ---	Nov 23
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7 Sleep spindles and K- complexes are seen in ----- sleep

Nov 23

HIGHER FUNCTIONS OF BRAIN

MCQ

1	Type of memory lost in Alzheimer's disease in -----	Nov 23
2	Loss of memory is called -----	Feb 23
3	Motor speech center is area -----	Mar 21

CEREBROSPINAL FLUID

SHORT ESSAYS

1	Describe the production, circulation and functions of the cerebro-spinal fluid	Oct 24
2	Cerebrospinal fluid	May 22

SHORT ANSWERS

3	Write a note on cerebrospinal fluid.	Jul 23
4	Blood brain barrier	Jan 24, Feb 15
5	Functions of CSF	Aug 12

MCQS

6	Cerebro spinal fluid is absorbed by.....	Aug 21
7	The primary function of the cerebrospinal fluid is to	Mar 21

SPECIAL SENSES

VISION

SHORT ESSAYS

1	Describe the errors of refraction	Jul 24
2	Draw and label the visual pathway showing the effect of lesion at various levels. Add a note on presbyopia	Jan 24
3	Describe the visual pathway with a help of a neat labelled diagram and explain the effects of its lesion. Add a note on direct and indirect light reflex	Jan 24, Aug 21, Mar 21
4	Describe the different refractive errors in vision and methods of correcting them.	Jul 23
5	Draw the accommodation reflex pathway. Describe the changes occurring during accommodation	May 23
6	Describe colour blindness	Nov 20
7	Dark adaptation in human eye	Aug 18
8	Describe the formation, composition and functions of aqueous humour	Aug 16

SHORT ANSWERS

9	Physiological basis of night blindness	Jul 23
10	Draw a labeled diagram of visual pathway. Explain the physiological basis of macular sparing	May 23
11	What is presbyopia and how is it corrected.	Feb 23
12	Accommodation reflex	Feb 22, Mar 21, Aug 13, Mar 12
13	Reading becomes progressively difficult with advancing age.Why?	Feb 22
14	Light reflex	Sep 21

DECIPHER-I

15	Draw and label : Visual pathway	Sep 21, Jan 19, Jan 18, Feb 16
16	Physiological basis of hypermetropia and myopia	Mar 21
17	Cornea survives inspite of its avascularity. Why?	Jan 20
18	Refractive errors	Aug 19
19	Near response in normal eye	Jul 17
20	Dark adaptation	Feb 17, Aug 15
21	Chorea	Aug 14, Feb 14
22	Bitemporal hemianopia	Feb 16
23	Hypermetropia	Feb 16
24	Draw and label : Wald's visual cycle	Feb 15
25	Visual pathway	Aug 13
26	Maximal visual acuity occurs at the fovea centralis .Why?	Aug 12

MCQS

Multiple response type

27	During accommodation to a near object, all the following statements are TRUE	Jul 24
	1) Lens assumes a more convex shape	
	3) Dilatation of pupils due to sympathetic stimulation	
	2) Convergence of axis of eyeball	
	4) Contraction of the medial rectus muscle of the eye	
	a) 1, 2 and 3 b) 2, 3 and 4 c) 1, 3 and 4 d) 1, 2 and 4	

Single response type

28	Where is the most likely site of lesion when the light reflex is present, and the accommodation reflex is absent	Jul 24
	a) Pretectal nucleus b) Retinal ganglion cells	
	c) Edinger-Westphal Nucleus d) Visual cortex	

Assertion and reason type

29	(A). In myopia the image is formed in front of the retina (R): The shorter eyeball can lead to convergence of light rays in front of retina	Oct 24
	a) Both A & R are correct and R is the reason for A	
	b) Both A & R are correct but R is not reason for A	
	c) A is incorrect R is correct	
	d) A is correct R is incorrect	

old question(1 mark)

30	Astigmatism is corrected using ----- lens	Jan 24
31	The type of muscle found in the iris of the eye is	May 23
32	In Argyll Robertson pupil, the reflex which is lost	May 23
33	The receptor for dim light vision is -----	Feb 23
34	The site of lesion in Argyll Robertson pupil is.....	May 22
35	The reason for presbyopia is loss of.....	May 22
36	Raised intraocular pressure is called.....	Feb 22
37	The receptor for dim light vision is	Mar 21

DECIPHER-I

AUDITION

PHYSIOLOGY-II

LONG ESSAYS

1	Draw and label the auditory pathway showing the receptors and the different synapses. Describe the different types of deafness with the tests used to differentiate them	Oct 24
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SHORT ESSAYS

2	Explain the functions of middle ear	Jul 24, May 22, Feb 22
3	Depict the auditory transduction using a flow chart. Add a note on masking of sound	Nov 23
4	Describe otolith organs and their functions.	May 23
5	Describe the mechanism of appreciation of sound waves and explain the theories of hearing.	Feb 23
6	Explain impedance matching occurring in the ear and describes the tympanic reflex	Jan 19
7	Describe the auditory pathway. List the types of deafness with a note on audiometry	Feb 15

SHORT ANSWERS

8	Functions of middle ear.	Jan 24, Mar 21, Jan 20, Jan 18, Aug 16
9	Explain the mechanism and importance of acoustic reflex in middle ear	Jan 23
10	Physiological basis of Hearing impairment due to advancing age.	Feb 23
11	Name the contents and describe the functions of middle ear.	Feb 23
12	Draw and label the Auditory pathway	Feb 22
13	Presbycusis	Sep 21
14	Draw and label the audiogram in conductive deafness. Super impose a normal audiogram on it.	Aug 21
15	Describe the role of basilar membrane in frequency discrimination	Mar 21
16	Tympanic reflex	Nov 20
17	Impedance matching	Nov 20, Aug 19, Aug 14, Aug 12
18	Attenuation reflex in middle ear	Aug 18
19	Masking in audition	Feb 17
20	Draw and label : Organ of corti	Feb 16
21	Cochlear microphonics	Feb 15, Feb 14
22	Hearing is impaired during severe cold or sore throat. Why?	Aug 12

MCQS

23	Name the receptors present within the utricle, saccule and the semicircular canals	Jan 24
24	Fluid present in inner ear is.....	Aug 21

GUSTATION

SHORT ANSWERS

1	Draw a neat labelled diagram of a taste bud and describe the taste pathway.	Feb 23
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2	Draw and label : Taste pathway	Feb 22, Aug 19, Feb 17, Aug 15
3	Describe the mechanism of transduction of sweet and salt sensation. Add a note on ageusia	Aug 21
MCQS		
single response type		
4	The threshold for taste stimulation is lowest for a) Sweet b) Sour c) Salt d) Bitter	Oct 24
5	The following cranial nerve DOES NOT transmit the taste sensations from tongue to brain a) Facial b) Hypoglossal c) Glossopharyngeal d) Vagus	Jul 24
old question(1 mark)		
6	Monosodium glutamate is associated with the primary taste sensation called -----	Jan 24
7	Sensation lost in ageusia is.....	Feb 22
OLFACTION		
SHORT ANSWERS		
1	Draw and label olfactory mucous membrane	Jan 20
2	Sniffing helps in the act of smelling	Jan 20
GENERAL QUESTIONS		
MCQ		
Assertion reason type		
3	(A): Vitamin A is required for the formation of new 11 cis-retinal in the retina (R): Night blindness occurs in patients with severe Vitamin A deficiency a) Both A & R are correct and R is the reason for A c) A is correct R is incorrect b) A is incorrect R is correct d) Both A & R are correct but R is not reason for A	Jul 24

BIOCHEMISTRY

PAPER-I:

CELL, ENZYMOLOGY, METABOLISM AND RELATED TOPICS OF CARBOHYDRATE, LIPID & PROTEIN, MINERALS, VITAMINS, BIOLOGICAL OXIDATION, INTEGRATION OF METABOLISM, NUTRITION, GENERAL QUESTIONS

PAPER-II:

NUCLEOTIDE CHEMISTRY & METABOLISM, ACID-BASE AND FLUID ELECTROLYTE BALANCE, HEMOGLOBIN, HEME METABOLISM & RELATED TOPICS, FUNCTION TESTS, MOLECULAR BIOLOGY, DETOXIFICATION, FREE RADICALS, EXTRA CELLULAR MATRIX, IMMUNOLOGY, LABORATORY TESTS, , GENERAL QUESTIONS

* The topics to different paper are generally evaluated under those sections. However, a strict division of the subject may not be possible and some overlapping of topics is inevitable. Students should be prepared to answer overlapping topics.

QUESTION PAPER PATTERN

Total duration- 3 hrs			
Question pattern	No of questions	Max mark	Total marks
Multiple choice questions(MCQ)	20	1 mark each	20
Essay questions	2	10 marks each	20
Short essay questions	6	6 marks each	36
Short answers	6	4 marks each	24
Total marks			100 marks

Pattern for multiple choice questions			
Sl.no	Type of questions	No of MCQ	Marks
1)	Single response type	5	5x1=5 marks
2)	Multiple response type	5	5x1=5 marks
3)	Assertion reason type	5	5x1=5 marks
4)	Clinical scenario based MCQs	1 scenario with 5 questions	5x1=5 marks

BIOCHEMISTRY PAPER-I

QUESTIONS

CHEMICAL BASIS OF LIFE

YEAR

SUBCELLULAR ORGANELLES AND CELL MEMBRANES

SHORT ESSAYS

1 Glucose transporters

Jul 23, Feb 17, Feb 16

SHORT ANSWERS

2 Mitochondria- structure & functions

Jul 24, Nov 23, Feb 23

3 Fluid mosaic model

Jan 24

4 Active transport

Jul 23

5 Peroxisome

May 23

6 Golgi complex

May 22

7 Ribosomes

Feb 22

8 Endoplasmic reticulum

Sep 21, Mar 21

9 Lysosomes

Aug 21

10 Glucose transporters

Aug 18, Jan 18

MCQs

single response type questions

11 Marker enzyme for golgi complex is

Oct 24

a) Lactate dehydrogenase

b) Galactosyl transferase

c) 5' Nucleotidase

d) Cathepsin

multiple response type questions

12 Regarding transport mechanisms choose the correct statement.

Jul 24

1) Oxygen and nutrients transport through simple diffusion

3) Vesicular transport does not require ATP

2) Facilitated diffusion does not require energy directly

4) Ion channels are transmembrane proteins

a) 1, 2 & 3 b) 2, 3 & 4 c) 3 & 4 d) 1, 2 & 4

Old questions (1 mark)

Feb 23

13 Marker enzyme for a) mitochondria b) peroxisome

May 22

14 Marker enzyme for mitochondria

Aug 21

15 Power house of the cell is

Aug 21

16 Marker enzyme for golgi apparatus

Jan 20

17 What are the components of membrane that alter

Aug 19

The fluidity

18 Mention one marker for each of the following

Jan 19

a) Peroxisome b) Golgi apparatus

19 What is the function of lysosome?

AMINOACIDS AND PROTEINS

May 23

SHORT ESSAYS

1 Sources biochemical functions and deficiency manifestations of thiamine

DECIPHER-I

BIOCHEMISTRY-I

- 2 Classify proteins based on their functions giving suitable examples.
- 3 Describe the structural organization of proteins

May 23

Feb 22

SHORT ANSWERS

- 4 Essential amino acids

Jul 24, Aug19,
Jan19, Jul17

- 5 Why heat coagulation is an irreversible process

Jul 24

- 6 Primary structure of protein

Jan 24

- 7 Keratin

May 23

- 8 Biologically important peptides

Feb 23, Aug 13

- 9 Nutritional classification of protein with examples

Feb 23

- 10 Define Peptide bonds. Enumerate two biochemically important peptides and their significance.

May 22

- 11 Definition and characteristics of denaturation

Sep 21

- 12 Protein denaturation

Mar 21, Feb 15,
Aug 15

- 13 Secondary structure of protein

Nov 20

- 14 What is isoelectric pH, mention its significance

Jan 20

- 15 Classify amino acids based on its metabolic fate

Jan 20

- 16 Non covalent bonds responsible for protein structure

Aug 19

- 17 Name the factors affecting BMR

Jan 19

- 18 Formation and characteristics of peptide bond

Jan 19

- 19 Functional classification of proteins

Jul 17

- 20 Heat coagulation

Aug 16

- 21 Define isoelectric pH. state properties of protein and its isoelectric pH

Aug 15

- 22 Alpha helix

Feb 13, Aug 12

MCOs

multiple response type questions

- 23 Regarding organization of protein structure, which of the following statements are CORRECT?

Oct 24

- 1) Presence of proline stabilizes secondary structure
 - 2) Quaternary structure is present for proteins with multiple subunits
 - 3) Denaturation of proteins disrupts secondary tertiary and quaternary structure
 - 4) Hydrogen bond is the main stabilizing force of tertiary structure
- a) 1,2,3,4 b) 1,3,4 c) 2,3 d) 1,2,3

Old questions (1 mark)

- 24 Why is heat coagulation irreversible?

Jan 24

- 25 Mention two semi essential amino acids

Nov 23

- 26 Mention two important products obtained from Tyrosine

May 23

- 27 Isoelectric pH of albumin

Feb 23

- 28 Mention two sulphur containing amino acids

Feb 22

- 29 Give two examples for complete protein

Feb 22

- 30 Name the semi essential amino acids

Feb 22

- 31 Primary structure of a protein refers to.....

Mar 21

- 32 Bond not broken in denaturation of protein

Jul 17

DECIPHER-I

BIOCHEMISTRY-I

- 33 One sulphur containing amino acid

Jul 17

- 34 Name four essential amino acids

Feb 15

- 35 What is isoelectric pH

Feb 15

- 36 Ketogenic amino acid

Aug 13

- 37 Mention two examples of biologically important peptides

Aug 13

- 38 Define BMR

Aug 12

ENZYMOLOGY: GENERAL CONCEPTS, ENZYME KINETICS, ISOENZYMES & CLINICAL ENZYMOLOGY

LONG ESSAYS

- 1 Explain various ways by which enzyme activity is regulated in human body. "Give suitable examples."

Oct 24

- 2 a) Define and classify enzymes giving one example each.
b) Enumerate the factors affecting enzyme activity
c) Describe the different types of enzyme inhibition with appropriate examples.

Nov 23

- 3 Define Enzyme, what are the factors affecting enzyme activity. Explain various mechanism of enzyme regulation.

Feb 23

- 4 Write IUMB classification of enzymes with examples and describe the factors affecting the enzyme activity

Feb 22

- 5 Define enzyme inhibition. Explain the different types of enzyme inhibitions. Mention the significance of enzyme inhibitors.

Sep 21

- 6 Define enzyme. Classify with suitable examples.
Discuss the various types of enzyme inhibitions with clinical examples.

Mar 21

- 7 Define enzymes.
Classify enzymes according to IUB System with one example each.
Mention three enzymes commonly estimated after myocardial infarction

Jul 17

SHORT ESSAYS

- 8 Enumerate three important Isoenzymes having clinical significance

Jul 24

- 9 What are the different types of enzyme inhibition. Explain with suitable examples.

Jan 24, Aug 16

- 10 Competitive Inhibition of enzymes with examples

Jul 23

- 11 Define competitive inhibition.
Describe the features of competitive inhibition Give three examples.

May 23

- 12 Name four therapeutically important enzymes and their significance

Feb 23

- 13 Describe the salient features of any two types of enzyme inhibition with suitable examples.

May 22

- 14 What are isoenzymes? Discuss the diagnostic importance of isoenzymes.

Jan 18

- 15 What are enzymes? Explain briefly the factors affecting the velocity of enzyme catalyzed reactions

Feb 17

- 16 Diagnostic significance of serum enzymes

Aug 15

SHORT ANSWERS

- 17 Km value and its significance

Jul 24

- 18 Classification of enzymes with suitable examples.

Jan 24

- 19 Write briefly on Covalent modification of enzymes with two suitable examples.

Jan 24

- 20 Give 2 examples for therapeutic use of enzymes

Feb 23

DECIPHER-I

BIOCHEMISTRY-I

21	Define isoenzymes. Discuss the clinical significance of different isoenzyme variants of creatine kinase	Feb 23
22	Isoenzymes and its diagnostic importance	Feb 22
23	Isoenzymes and their clinical significance	Mar 21, Nov 20
24	Suicide inhibition? Explain with one example	Mar 21, Feb 14
25	Diagnostic importance of enzymes	Mar 21
26	Non competitive inhibition	Nov 20
27	List two examples for competitive inhibition with its clinical significance	Jan 20
28	Types of specificity of enzymes with examples	Aug 19, Feb 15
29	Isoenzymes of creatine phosphokinase	Aug 19
30	Name four enzymes of diagnostic significance of liver disease	Aug 19
31	Define Km value and its significance	Jan 19, Aug 18, Feb 15, Feb 14
32	Pro-enzymes	Aug 16
33	Michaelis menten constant	Aug 16
34	Allosteric enzymes	Aug 15
35	Iso-enzymes	Aug 13
36	Enzyme markers of myocardial infarction	Feb 13
37	Covalent modification	Aug 12

MCQs

single response type questions

38	Addition of an inhibitor to an enzyme catalyzed reaction reduced Vmax without altering the Km of the enzyme. The type of enzyme inhibition seen here is a) Noncompetitive inhibition b) Uncompetitive inhibition c) Competitive inhibition d) Mechanism based inhibition	Oct 24
39	Enzymes which break C-O, C N and C C bonds without addition of water are called a) Ligases b) Hydrolases c) Transferases d) Lyases	Oct 24

Assertion (A) and Reason (R)

40	(A): Hydroxylases are also called dioxygenase. (R): Hydroxylases catalyzes addition of a molecule of oxygen to their substrates a) Both A and R are correct but R is not the reason for A b) A incorrect R correct c) Both A and R incorrect d) Both A and R are correct R is reason for A	Oct 24
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case scenario-based questions

41	A child of a farming family has accidentally ingested pest control agent which contains cyanide as one of the major component. He was immediately rushed to the hospital. i. Which of the following enzymes will be inhibited a) Aconitase. b) Cytochrome oxidase c) Cytochrome reductase d) Cytochrome C ii. What kind of inhibition will occur in this case a) Competitive inhibition b) Non-competitive inhibition	Jul 24
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DECIPHER-I

BIOCHEMISTRY-I

c) Allosteric inhibition	d) Suicide inhibition
iii. What will happen to the Vmax	
a) Unchanged	b) Increases
c) Decreases	d) Initially increases then decreases
iv. Following are the examples with same process of inhibition EXCEPT	
a) Heavy metals b) Fluoride c) Iodoacetate d) Allopurinol	
v. Which of the following about the given inhibition is true	
a) Increasing substrate concentration will abolish the inhibition	
b) Increasing substrate concentration will not abolish the inhibition	
c) Inhibitor binds to same domain as the substrate binding site	
d) Both a and c	

Old questions (1 mark)

41	Give suitable example for suicide enzyme inhibition.	Jan 24
42	Enzyme defect in homocystinuria	May 23
43	Give an example for oxidoreductases. Write one reaction catalyzed by oxidoreductase	Feb 23
44	Define optimum temperature.	Sep 21
45	Clinical importance of acid phosphatase and alkaline phosphatase	Mar 21
41	What are the isoenzymes of creatine phosphokinase	Jan 20
42	Therapeutic uses of enzymes	Feb 17, Feb 13
43	List two clinical examples of competitive inhibition	Feb 14

CHEMISTRY OF CARBOHYDRATES

SHORT ESSAYS

1	Composition, location and functions of mucopolysaccharides	Oct 24
2	Define and classify Polysaccharides with examples. Write clinical applications of any three polysaccharides	Jul 24
3	Classify carbohydrates with suitable examples. What are epimers?	Jan 19

SHORT ANSWERS

4	Compare and contrast amylose and amylopectin.	Jan 24
5	Dietary fibre	Jul 23, Jan 18, Feb 17
6	Why sucrose is a non reducing sugar?	Jul 23
7	Importance of dietary fibre	May 23
8	Isomerism of carbohydrates	Feb 22
9	Epimers	Mar 21
10	Differentiate between starch and glycogen	Jan 20, Aug 18
11	Invert sugar	Aug 16
12	mutarotation	Aug 13
13	What are glycosaminoglycans? List two examples with its function	Feb 13

MCQs

single response type questions

14	Transparency of corneal endothelium is maintained by a) Heparan sulphate b) Chondroitin sulphate c) Keratan sulphate d) Hyaluronic acid	Jul 24
15	Sucrose is a non-reducing sugar. Why?	Jan 24, May 22,

Old questions (1 mark)

15	Sucrose is a non-reducing sugar. Why?
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Alina

DECIPHER-I

16	Define Mutarotation	Jan 18
17	False positive benedict's test	Nov 23
18	Define epimerism	Nov 23
19	Name two non-carbohydrates which give a positive benedicts tests	Feb 23
20	Hetero polysaccharide having anticoagulant function	Feb 23
21	Name the reducing substance excreted in urine	Aug 21
22	Two examples for dietary fibre	Jan 20
23	What are glycosides? Mention one example	Aug 19
24	Benedict's test	Aug 18
25	List two examples of mucopolysaccharides	Feb 17
26	What are epimers	Feb 15
		Aug 13, Aug 12

CHEMISTRY OF LIPIDS

SHORT ESSAYS

1	Structure and functions of phospholipid	Jul 24
2	Classify phospholipids and enumerate their functions	Feb 22
3	Functions of phospholipids	Feb 16
4	What are essential fatty acids. Enumerate them. List two functions and one deficiency manifestation	Feb 13

SHORT ANSWERS

5	Give reason: "Premature infants have higher incidence of Respiratory Distress Syndrome"	Jul 24
6	Micelles	Jul 24, Jul 23
7	Trans fatty acids	Jul 24
8	Functions of phospholipids	Jan 24, Feb 22, Jul 17, Feb 14
9	What are amphipathic lipids. Add a note on its significance	Feb 23
10	Name two phospholipids and their functions	Nov 20
11	Essential fatty acids	Aug 16, Aug 15
12	Name the lung surfactant and mention its components	Feb 14
13	Classification of glycolipids	Aug 12

MCQs

Old questions (1 mark)

14	Differentiate between cis and trans fatty acids	Jan 24
15	Name a non-glycerol containing phospholipid and mention its significance	Feb 23
16	Name essential fatty acids	Feb 23, Mar 21, Nov 20
17	What is lecithin and mention its use	Aug 13

GENERAL METABOLISM

OVER VIEW OF METABOLISM

SHORT ANSWERS

1	Metabolic changes in the body during brief fasting	Oct 24
2	Role of Liver in integration of metabolism	Jul 24

BIOCHEMISTRY-I

DECIPHER-I

METABOLIC PATHWAYS OF GLUCOSE

BIOCHEMISTRY-I

LONG ESSAYS

1	A 2-year-old child presented with liver enlargement and complaints of weakness, sweating and pallor which disappeared on eating food. Mother revealed that milestones were delayed. On investigation, blood glucose: 50mg/dl, uric acid: 10 mg/dL, lactic acid: 15 mg/dL, cholesterol: 300 mg/dL, and presence of ketone bodies. a) What is the likely diagnosis b) Name the enzyme defect c) Discuss the pathways that lead to elevated levels of uric acid, lactic acid, and cholesterol d) Discuss the reason for liver enlargement <i>accumulation of glycogen</i> e) Give the normal reference range for serum cholesterol and Fasting blood glucose.	Jan 24
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DIAGNOSIS : Von Gierke's Disease

2	Define gluconeogenesis. Name the substrates for gluconeogenesis. Trace the pathway of gluconeogenesis from pyruvate to glucose. Add a note on its regulation.	Jan 24
3	A 2-year-old child presented with complaints of on and off vomiting and lethargy for past two months. On examination child had a massive liver enlargement. Blood investigation reports were as follows: Blood sugar: 50mg%, Uric acid: 10mg%, lactic acid: 15mg%, Total cholesterol: 300mg%. Liver biopsy demonstrated the mosaic pattern of enlarged hepatocytes, exhibiting abundant clear cytoplasm containing glycogen and lipid vacuoles. a) What is the diagnosis b) Name other glycogen storage disorders c) Explain how glycogen is metabolized in the body d) Explain the hormonal regulation of glycogen metabolism	Nov 23

DIAGNOSIS : Von Gierke's Disease

4	Explain the pathways by which glycogen is synthesized and broken down in the body. Describe how these pathways are regulated	Feb 22
5	Trace the pathway of gluconeogenesis starting from alanine. Mention the key enzymes and how they are regulated	Jan 19, Aug 16
6	Explain the reactions of glycogenesis and glycogenolysis with flow diagrams. Describe how these processes are regulated	Feb 15
7	Explain in detail glycogenesis and glycogenolysis. Mention the enzyme defects in any two of glycogen storage disorders	Feb 14
8	Describe by a flow diagram the reactions of glycolysis giving names of enzymes involved. Explain its regulation and add a note on the energetic in aerobic and anaerobic conditions	Feb 13

SHORT ESSAYS

9	Write down the steps involved in conversion of glycerol to glucose.	Oct 24
10	What are the reactions that form NADPH. List any FOUR reactions where NADPH is utilised.	Oct 24

DECIPHER-I

BIOCHEMISTRY-I

11	Describe HMP shunt pathway. Add a note on the significance of the pathway.	Jul 24, Feb 23
12	Explain glycolysis, regulation and its energetics	Feb 23
13	Cori's cycle and its significance	Aug 21
14	Glycogenolysis and its regulation	Mar 21
15	Gluconeogenesis	Nov 20, Aug 15
16	Mention the major functions of HMP shunt pathway. Explain its importance in erythrocytes.	Jan 20
17	Glycogen storage diseases	Aug 19
18	Discuss the regulation of glycogen metabolism	Jan 18
19	Explain the digestion and absorption of carbohydrates	Feb 13
SHORT ANSWERS		
20	Fate of pyruvate	Jul 24, Feb 13
21	Von Gierke's disease	Jan 24, Jul 23, Mar 21, Jan 20, Aug 16
22	Products of HMP shunt pathway	Jul 23
23	Describe the digestion and absorption of carbohydrates	May 23
24	Significance of HMP shunt pathway	May 23, Feb 22
25	Lactose intolerance	Feb 23
26	Uronic acid pathway	Feb 23
27	Cori's cycle	Feb 23, Nov 20, Feb 17
28	Substrate level phosphorylation	May 22, Sep 21, Aug 16
29	Enumerate the clinical significance of HMP pathway	Feb 22
30	Formation of 2,3 BPG	Feb 22
31	Rapaport Leubering pathway	Mar 21, Feb 16
32	Mention the significance of hexose monophosphate shunt pathway	Jan 18, Aug 15, Aug 14, Aug 12
33	Enumerate irreversible steps of glycolysis with the enzymes involved	Jul 17
34	Define gluconeogenesis. Name the gluconeogenic substrates	Jul 17
35	Essential pentosuria	Aug 16
36	Pyruvate dehydrogenase complex	Feb 16
37	Name three glycogen storage disease and its biochemical defect	Aug 15
38	Digestion of carbohydrates	Aug 15, Aug 14
39	What is glucose alanine cycle and mention its significance	Feb 15
40	Lactose intolerance	Aug 14
41	Gluconeogenesis	Feb 14
42	Two co-enzyme roles of NADPH	Feb 13
MCQs		
single response type questions		
43	Product of action of debranching enzyme on glycogen is a) Glucose b) Glucose 6 phosphate c) UDP glucose d) Glucose 1 phosphate	Oct 24
44	A person has a meal at 8 pm at night and records blood glucose at 7 am	Jul 24

DECIPHER-I

BIOCHEMISTRY-I

on the next day which came to 180 mg/dl. What's the source of this glucose. a) Dietary glucose b) Hepatic gluconeogenesis c) Hepatic glycogenolysis d) Protein breakdown		
multiple response type questions		
45	Which of the following are high energy compounds 1) 1,3-bisphosphoglycerate 2) Creatine phosphate 3) Glucose 6-phosphate 4) Phosphoenol pyruvate a) 1, 2, 4 b) 1,3 c) 1,2,3,4 d) 2,3	Oct 24
Old questions (1 mark)		
46	Which tissues prefer anaerobic glycolysis	Jan 24
47	In glycolysis, which enzyme is inhibited by fluoride.	Jan 24
48	NADPH generating steps in HMP shunt pathway	Nov 23
49	Enzyme defect in Von Gierke's disease	May 23, May 22, Aug 21
50	Mention the importance of 2,3 BPG	May 23
51	Enzyme defect in - a) Alkaptonuria b) Von Gierke's disease	Feb 23
52	Give an example for substrate level phosphorylation	Feb 23
53	Name two metabolites of biochemical importance formed in HMP pathway	Feb 23
54	Key enzyme of HMP shunt pathway	Sep 21
55	Give two salient points to compare and contrast hexokinase and glucokinase	Aug 21
56	Biochemical defect in Lactose intolerance	Aug 21, Feb 13
57	Define gluconeogenesis	Aug 21
58	Curd is an effective treatment for lactose intolerance. Justify	Mar 21
59	Patients with G6PD deficiency should not be treated with anti-malarials. Why?	Mar 21
60	Clinical significance of serum amylase	Nov 20, Jan 19
61	List two symptoms produced by neuroglucopenia	Jan 18
62	Name the substrate for gluconeogenesis	Feb 17
63	Mention any two key enzymes of glycolysis	Aug 14
64	Why starch can be utilised by humans but not cellulose	Feb 14
65	Important product of Rapoport Luebering cycle in RBC	Aug 12
REGULATION OF BLOOD GLUCOSE, INSULIN AND DIABETES MELLITUS		
LONG ESSAYS		
1	Mention the normal glucose levels in fasting, post prandial and random samples and HbA1c levels. Explain the homeostasis of Blood glucose levels in well fed condition and during starvation.	Jul 24
2	A 45-year-old man complaints of increased appetite, thirst, and frequent micturition. His random blood sugar is 346 mg/dl • What is the diagnosis. What are the diagnostic criteria • Discuss the relevant investigations that can be done for further monitoring of the patient • How is blood glucose regulated • What is the renal threshold for Glucose	May 22

DIAGNOSIS : TYPE 2 DIABETES MELLITUS

- 3 A 45-year-old bank manager visits the OPD with increased frequency of urination (Polyuria), Increased thirst (Polydypsia) and increased hunger (Polyphagia). He also gives the history of weight loss. On general examination, there were no significant findings. The laboratory investigations were as follows:

Test	Result	Biological reference interval
Random blood glucose level	316 mg/dl	70-140 mg/dl
Urine sugar	++++	NIL

Answer the following questions using the above data:

- What is the diagnosis.
- Mention various methods for estimation of glucose
- What are WHO criteria for diagnosis of this disorder
- Why urine sugar was positive in this patient
- Describe the various factors that regulate blood glucose level

DIAGNOSIS : TYPE 2 DIABETES MELLITUS

- 4 23-year-old female was brought to casualty with the complaints of dizziness, weakness and fainting attack. History revealed that she had skipped her breakfast and lunch with intention of losing weight. Random blood glucose was 40 mg/dl. All other investigations were normal.
- What is the probable diagnosis
 - What is the normal blood glucose level
 - Describe the regulation of blood glucose.
 - Add a note on glucose tolerance test.

DIAGNOSIS : HYPOGLYCEMIA**SHORT ESSAYS**

- 5 Glucose Tolerance Test – give two indications. Explain the different responses seen
- 6 Define obesity. What are the metabolic changes and complications of obesity
- 7 Absorption of carbohydrates.
- 8 Regulation of blood glucose level

SHORT ANSWERS

- 9 Biochemical basis of- "Adding KCl to Insulin while treating DKA"
- 10 Hormones regulating blood glucose level
- 11 Hypoglycemia
- 12 Renal glycosuria.
- 13 Diagnosis of diabetes mellitus
- 14 Monitoring of diabetes mellitus
- 15 What is HbA1c and mention its clinical importance
- 16 Discuss the primary structure of human insulin
- 17 Explain why blood is collected in fluoride for glucose estimation

single response type questions

- 18 A diabetic diet should contain
- 19 a) Refined carbohydrates b) Foods with high glycemic index
c) Foods with low glycemic index d) Large quantities of roots and tubers

case scenario-based questions

- 20 A 30-year-old male a known diabetic on regular treatment was admitted in emergency in altered mental state and acidotic breath. His random plasma glucose was 870mg/dL.
- i. On analysis of blood which of the following will be very high in this patient
- a) Acetone b) Beta hydroxy butyrate
c) Acetoacetate d) Phenylketones
- ii. Liver is the site of ketogenesis, but can not utilize ketone bodies because of absence of which of the following enzymes
- a) HMG CoA reductase b) Thiolase
c) HMG CoA synthase d) Thiophorase
- iii. All the following endocrinopathies are associated with hyperglycemia EXCEPT
- a) Acromegaly b) Cushing disease c) Pheochromocytoma d) Insulinoma
- iv. WHO criteria for diagnosis of diabetes mellitus include all the following EXCEPT
- a) Fasting plasma glucose ≥ 126 mg/dL
b) Random plasma glucose ≥ 200 mg/dL along with classical symptoms of DM
c) Postprandial plasma glucose ≥ 140 mg/dL
d) Glycated hemoglobin 26.5%
- v. Early sign of renal involvement in patients with diabetes mellitus is increased urinary excretion of
- a) Hemoglobin b) Creatinine c) Glucose d) Albumin

Old questions (1 mark)

- 21 Define hypoglycemia
- 22 Name two conditions that cause ketosis
- 23 What is HbA1c. What is its significance
- 24 Renal glycosuria
- 25 Renal threshold value for glucose
- 26 Liver plays a major role to produce hyperglycemia in diabetes mellitus

METABOLIC PATHWAYS OF CARBOHYDRATES OTHER THAN GLUCOSE**SHORT ANSWERS**

- 1 A 2-year-old baby was brought to the pediatrics department by her mother with complaints of vision problems. On examination baby was jaundiced and had cataract in both eyes. Abdomen examination showed hepatomegaly. Blood investigation showed serum bilirubin: 6.4 mg/dL and plasma glucose: 45 mg/dL
- a) What is your probable diagnosis

DECIPHER-I

BIOCHEMISTRY-I

2	b) What are the types, biochemical defect, clinical features and their basis, diagnosis and treatment of this disorder	Sep 21, Mar 21, Aug 19, Feb 17
	DIAGNOSIS : GALACTOSEMIA	
3	Galactosemia	Mar 21
4	Name three glycosaminoglycans and their functions	Jan 18
5	Mention the enzyme defective in galactosemia. Add a note on the clinical features of galactosemia.	

MCQs

Assertion (A) and Reason (R)

5	(A) In Galactosemia Hypoglycemia is seen (R) Galactose-1-phosphate accumulated in Galactosemia and it inhibits Galactokinase and glycogen phosphorylase a) Both A and R are correct but R is not the reason for A b) A incorrect R correct c) Both A and R incorrect d) Both A and R are correct R is reason for A	Oct 24
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Old questions (1 mark)

6	Enzyme defect in a) Maple Syrup Urine Disease b) Hereditary Fructose Intolerance	Nov 23
7	Enzyme deficient in Galactosemia	Jul 23, Feb 22, Jan 20
8	Mention two causes of fatty liver	May 23
9	Name the marker enzyme for alcoholism	Feb 22
10	Mention the biochemical disorder in fructosuria	Feb 15

METABOLISM OF FATTY ACIDS

LONG ESSAYS

1	What are the types of fatty acid oxidation. Explain in detail the oxidation of palmitic acid and its regulation	Jul 23
2	Describe the breakdown of triglycerides, the mobilization of fatty acids. Discuss the beta oxidation of palmitic acids. Add a note on its energetics	May 23
3	What are ketone bodies. How are they formed in the body. Describe the role of ketone bodies in starvation and uncontrolled diabetes mellitus.	Feb 23
4	Define Beta oxidation. Enumerate the steps and add a note on its regulation. Explain the energetics for palmitic acid.	May 22
5	Name the ketone bodies. Describe their synthesis and catabolism. Write the causes of ketosis	Aug 21
6	What is β oxidation. Describe the process of β oxidation of even chain fatty acids with energetics.	Mar 21
7	Name the site where betaoxidation of fatty acid occurs. Describe the steps involved in beta oxidation of fatty acids. Explain how much energy is released in beta oxidation of one molecule of palmitic acid	Jan 18
8	Explain the oxidation of palmitate in mitochondria. Describe how the process is regulated. Mention the number of high energy phosphate bonds generated in palmitate oxidation	Feb 17

DECIPHER-I

BIOCHEMISTRY-I

9	Define β -Oxidation. Explain the reactions of β -Oxidation of palmitic acid. Add a note on its energetics	Sep 11
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SHORT ESSAYS

10	Define Beta Oxidation. Explain the steps, regulation & energetics.	Jul 24
11	Explain the steps of β -oxidation of palmitic acid, giving energetics.	Jan 24
12	How are dietary triglycerides absorbed and transported in plasma. Briefly explain the transport of dietary triglyceride from intestine to liver.	Jan 24
13	Describe the reactions of Beta oxidation in the mitochondrial matrix. Add a note on ATP yield from palmitate.	Jan 24
14	Describe the denovosynthesis of fatty acid. Add a note its regulation	Nov 23
15	How are lipids digested and absorbed. Add a note on the associated disorders	Feb 23
16	Ketone body metabolism.	Sep 21
17	Describe the steps of beta oxidation. Calculate the energetics from palmitic acid.	Mar 21
18	Formation and utilization of ketone bodies	Nov 20
19	Explain the steps of beta oxidation of fatty acids	Aug 18
20	Define carnitine and explain its role in oxidation of fatty acids	Aug 16
21	Name the ketone bodies. Describe the process of ketogenesis. List the condition that lead to ketoacidosis	Feb 14
22	Fatty acid synthase complex	Aug 12

SHORT ANSWERS

23	Adipose tissue is an endocrine organ. Explain	Oct 24
24	Describe any two Shuttle mechanisms across the mitochondrial membrane.	Jan 24
25	Explain the transport of dietary lipids from intestine	Nov 23
26	Fatty liver and lipotropic factors	Feb 23
27	Name the ketone bodies and describe their synthesis	Feb 22
28	Tests for detection of ketone bodies in the urine	Feb 22
29	Enzyme defect in the methyl malonyl aciduria and refsum's disease	Aug 21, Nov 20, Jan 20, Jul 17, Feb 16, Feb 13, Aug 13
30	Lipotropic factors	Aug 21, Feb 16
31	Brown adipose tissue	Mar 21
32	Fat is burnt under the fire of carbohydrates. Justify this statement.	Jan 20
33	Role of carnitine in fatty acid oxidation with the help of a diagram.	Aug 19, Jul 17
34	Carnitine shuttle	Aug 19
35	Causes of fatty liver	Aug 18
36	Bile salts	Aug 16
37	Name different lipases involved in lipid metabolism and mention its functions	Feb 16
38	Carnitine deficiency	Feb 16
39	Bile salts and functions	

DECIPHER-I

BIOCHEMISTRY-I

40	Enumerate primary and secondary bile acids	Feb 16
41	Role of carnitine	Feb 15

MCQs

multiple response type questions

42	True about ketone body metabolism 1) Insulin inhibit formation of ketone bodies 2) Sweet smell in DKA patients is due to acetoacetate 3) Liver cannot utilise ketone bodies due to lack of thiolase 4) Regulatory enzyme for ketogenesis is HMG CoA synthase a) 1 & 3 b) 2 & 4 c) 1 & 4 d) 2 & 3	Jul 24
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Old questions (1 mark)

43	Name ketone bodies	Jul 24, Nov 23
44	Which fatty acid accumulation gives rise to Refsum's disease.	Jan 24
45	Mention two lipotropic factors	Feb 22
46	Name two clinical conditions causing ketosis	Mar 21
47	Biochemical defect in Refsum's disease	Aug 19
48	What are the amino acids that take part in the synthesis of carnitine?	Jan 19
49	Site of oxidation of very long chain fatty acids	Feb 16
50	Name the rate-limiting enzyme in fatty acid synthesis	Aug 16
51	Action of hormone sensitive lipase	Aug 18
52	Why alcohol ingestion causes fatty liver?	Feb 14

CHOLESTEROL AND LIPOPROTEINS

LONG ESSAYS

1	A man of 45 years of age is overweight with a sedentary lifestyle underwent an annual health Test checkup Following are the details of the investigations.	May 23
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Test	Result	Units	Biological reference interval
Fasting blood glucose	115	Mg/dl	70-110
Total cholesterol	250	Mg/dl	150-200
triglycerides	269	Mg/dl	50-200
HDL cholesterol	24	Mg/dl	30-60
LDL cholesterol	172	Mg/dl	80-120

Answer the following questions using the above data:

- What is the probable diagnosis
- Mention the causes for the above condition
- Briefly describe chylomicron metabolism
- Briefly describe hyperlipidemia

DIAGNOSIS:HYPERLIPIDAEMIA

SHORT ESSAYS

2	Discuss the metabolism of chylomicrons	Feb 22
3	Describe the role of lipoproteins in cholesterol transport	Feb 15

SHORT ANSWERS

4	Classification of Lipoproteins	Jul 23
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DECIPHER-II

BIOCHEMISTRY-I

5	Functions of apolipoproteins.	Sep 21
6	Functions of cholesterol	Aug 21, Feb 13, Aug 12
7	Lipoproteins	Sep 21, Feb 17
8	Reverse cholesterol transport	Mar 21, Jan 18
9	Compounds derived from cholesterol	Mar 21
10	Functions and significance of Low density lipoproteins	Nov 20
11	Which is good cholesterol and why it is called so ?	Jan 19
12	Mention the rate limiting step and the inhibitors of cholesterol synthesis	Feb 16
13	Regulation of cholesterol synthesis	Aug 13
14	LDL receptors	Aug 13

MCQs

single response type questions

15	A patient with tendon xanthoma, high LDL and high serum cholesterol. What is the diagnosis a) LPL deficiency c) Familial hypercholesterolemia b) Tangier's disease d) Familial Hyperchylomicronemia	Jul 24
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multiple response type questions

16	The FALSE statements regarding apolipoproteins are 1) Apolipoprotein C-II inhibits lipoprotein lipase enzyme 2) Apolipoprotein E is a ligand for LDL receptor 3) Apolipoprotein A-1 inhibits lecithin cholesterol acyl transferase 4) Apolipoprotein B48 and B100 are products of RNA editing a)1,2,3 b)2,4 c)1,2,3,4 d)1,3	Oct 24
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Old questions (1 mark)

17	Give the normal plasma levels of following parameters (a) Cholesterol (b) Triglycerides	Jan 23
18	Regulatory enzyme in cholesterol synthesis	Nov 23
19	Give the normal reference range for FBS Serum cholesterol	Feb 23
20	Give the normal reference range for Serum triglyceride and Serum creatinine.	May 22
21	Mention two derivatives of cholesterol	Feb 22, Aug 16
22	Give biological reference range for serum triglycerides	Feb 22
23	What is the normal blood level of total cholesterol.	Sep 21, Mar 21
24	Normal serum cholesterol level	

CARDIOVASCULAR DISEASES, BIOMARKERS OF CVD AND HYPERLIPIDEMIAS

SHORT ANSWERS

1	Isoenzymes as Cardiac Markers	Feb 23
2	Cardiac markers	Feb 22
3	List the cardiac markers	Sep 21

MCQs

Old questions (1 mark)

4	Isoenzymes as cardiac markers	Jul 24
5	Name two causes for hyperlipidemia	Jul 23

DECIPHER-I

BIOCHEMISTRY-I

6	Define atherosclerosis	May 23
7	Name any two biomarkers of myocardial infarction	May 23
8	Name two cardiac markers	May 22
9	Plasma lipoprotein which is inversely correlated with coronary heart disease	Feb 15

MCFA, PUFA, PROSTAGLANDINS AND COMPOUND LIPIDS

SHORT ESSAYS

1	Functional and therapeutic role of prostaglandins	Jan 19
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SHORT ANSWERS

2	PUFA (Poly Unsaturated Fatty Acids)	Jul 23
3	Functions of prostaglandins	Aug 19, Aug 18

MCQs

Old questions (1 mark)

4	Name two prostaglandins and mention their importance	May 22
5	Mention the enzyme deficient in Tay Sach's disease	Sep 21, Aug 16
6	Enzyme defect in Gaucher's disease	Mar 21, Feb 16
7	Name two lipid storage disorders	Jan 18
8	Name the deficient enzyme in Niemann pick disease	Aug 14

GENERAL AMINO ACID METABOLISM: UREA CYCLE AND ONE-CARBON METABOLISM

LONG ESSAYS

1	11-month-old infant was brought to the out-patient department with complaints of vomiting, refusal to feeds failure to gain weight and lethargy for past few weeks. He is born of non-consanguineous marriage and pregnancy was uneventful. Parents also complained of delayed milestones. His laboratory investigations is as follows: Plasma glucose random: 84 mg/dL, Serum urea: 6 mg/dL, Plasma ammonia: <u>Elevated</u> , Plasma citrulline: <u>decreased</u> a) What is your probable diagnosis b) Why ammonia is toxic to the body c) Explain detoxification of ammonia and the regulation of the process d) Enumerate any TWO ways of reducing plasma ammonia levels	Oct 24
DIAGNOSIS: HYPERAMMONEMIA TYPE -2		
2	Explain the formation and disposal of Ammonia. Add a note on the urea cycle disorders	Nov 20
3	Describe the pathway for synthesis of urea. Add a note on the regulation of the pathway. Name two conditions in which blood urea is increased giving the biochemical basis or enzyme defect	Aug 14

SHORT ESSAYS

4	Explain how proteins are digested and absorbed in the body	Nov 23
5	Describe the urea cycle and add a note on its regulation.	May 23
6	Describe in detail the reactions of transamination and oxidative deamination. Add a note on the significance of these reactions	Feb 23
7	Describe the reactions of urea cycle. Discuss the diagnostic significance of blood urea.	Feb 22
8	Discuss the detoxification of ammonia in the body. Mention two inborn	Jan 20

DECIPHER-I

BIOCHEMISTRY-I

9	errors associated with it.	
10	Transamination	
11	Define transamination and explain by giving two examples	Aug 19
12	Mention the normal blood urea level. Explain how urea is synthesized in the body	Jul 17
13	Describe the reactions of urea cycle. Discuss the interrelationship between urea cycle and citric acid cycle	Feb 14

SHORT ANSWERS

13	Describe the Biochemical basis of: " Ammonia Toxicity "	Aug 12
14	Transamination reactions	Jan 24, Jul 23
15	What is transamination. Mention clinical importance of any two transaminases	Feb 22
16	What is transamination. Explain the diagnostic significance of any one serum transaminase	Jan 20
17	Orotic aciduria	Aug 18
18	Decarboxylation of amino acids	Aug 16
19	Sources of ammonia	Aug 15
20	Transamination	Aug 14, Feb 13

MCQs

Assertion (A) and Reason (R)

21	(A): Hyperammonemia Type I is due to enzyme defect in urea cycle (R): Defective enzyme is Carbamoyl phosphate synthetase II a) Both A and R are correct but R is not the reason for A c) A correct R incorrect b) Both A and R are incorrect d) Both A and R are correct R is reason for A	Jul 24
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Old questions (1 mark)

22	Normal range of serum urea and creatinine	Nov 23, Jul 23
23	Biochemical defect in orotic aciduria	Feb 23
24	Protein digestion starts in _____	Mar 21
25	Why orotic aciduria occur in type II hyper ammonemia	Jan 18
26	Which is the decarboxylation product of histidine?	Jan 19
27	What are cathepsins	Feb 14
28	Name the coenzyme required for transamination reactions	Aug 12

METABOLISM OF ALIPHATIC AMINO ACIDS

SHORT ESSAYS

1	Outline the metabolism of glycine under following heads. Synthesis of glycine, synthesis of biologically important compounds from glycine.	Mar 21
2	Important compounds derived from glycine	Mar 21

SHORT ANSWERS

3	Synthesis of biogenic amines and their biological role.	Oct 24
4	Homocystinuria	Jan 24
5	Write briefly on the biologically important compounds synthesized from Glycine.	Jan 24
6	Describe the synthesis of any two compounds of biomedical importance synthesized from glycine	May 22

DECIPHER-I

7	Transmethylation reaction	Mar 21, Feb 17, Aug 14
8	What is glutathione and mention its importance in body	Jan 20, Feb 17
9	Formation and functions of nitric oxide	Jan 18
10	GABA	Jan 18, Aug 13
11	Primary hyperoxaluria	Jan 18
12	Glutathione peroxidase	Aug 18
13	What is active methionine? Mention two examples of transmethylation reaction	Feb 15
14	Active methionine	Aug 14
15	Glucose alanine cycle	Feb 13
16	Mention three examples of transmethylation reactions	Aug 12
17	Importance of glutamine	Aug 12

MCQs

single response type questions

18	Which of the following to be supplied in the diet in patients with Cystathionine beta synthase defect a) Cysteine b) Methionine c) Serine d) Homocysteine	Jul 24
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Old questions (1 mark)

19	Enzyme defect in - (a) Maple Syrup Urine Disease (b) Albinism.	Jan 24
20	Enzyme defect in - a) Maple Syrup Urine Disease b) Hereditary Fructose Intolerance	Nov 23
21	Name two compounds formed from glycine	Feb 23, Sep 21, Nov 20, Feb 17
22	Enzyme defect in maple syrup - urine disease	Feb 23, Feb 22, Aug 12
23	Enzyme defect in homocystinuria	Mar 21
24	Glutathione	Nov 20
25	What is gamma amino butyric acid and mention one function.	Jan 20, Aug 16
26	Two functions of polyamines	Aug 19
27	List the compounds formed from arginine	Feb 14

AROMATIC AND HETEROCYCLIC AMINO ACIDS

LONG ESSAYS

1	Explain in detail Phenylalanine metabolism with a note on inborn errors associated with and relevant biochemical investigations for them	Jul 24
2	Mother noticed that her child didn't attain milestone for the age. Mother also noticed hypopigmentation. • Name the amino acid involved • What is the diagnosis • What is the metabolism of the amino acid. Mention the inborn errors associated with its metabolism • Enumerate the laboratory investigations aiding in the diagnosis. • Name two specialized compounds formed from tyrosine and discuss their formation in brief DIAGNOSIS: PHENYLKETONURIA	Feb 23
3	A 50 years old man with 3 years history of hypertension and occasional	Aug 21

BIOCHEMISTRY-I

DECIPHER-I

panic attacks reported to hospital with episode of throbbing headache, associated with excessive sweating. He gave history of similar attacks earlier. On examination, his BP was 180/100 mm Hg and pulse was 82/min. urine examination revealed very high levels of 24 hrs VMA.

- What is the probable diagnosis?
- Name the aromatic amino acids
- Describe the biochemical basis of symptoms and urinary finding
- Describe the synthesis of any two biochemically important compounds from the parent amino acid

DIAGNOSIS : PHEOCHROMOCYTOMA

What are biologically important compounds derived from tyrosine? Explain the catabolism of tyrosine and name three inborn errors associated with tyrosine metabolism.

Discuss in detail the metabolism of phenylalanine. Name four biologically important compounds synthesized from phenylalanine. State two metabolic disorders associated and indicate the defective enzymes.

Discuss the metabolism of phenylalanine

SHORT ESSAYS

A child was brought to the Pediatric OPD of the hospital, mother gave history of convulsions, delayed milestones and mental retardation. On examination child was dull and had a blank look, there was mousy odour of the body and urine.

- What could be your probable diagnosis
- Mention the enzyme defect
- Explain the Biochemical basis for the clinical manifestations mentioned in the above case.
- Mention any two Diagnostic tests done in this case

DIAGNOSIS: PHENYLKETONURIA

Describe the steps by which catecholamines are synthesized. Outline the pathway of their degradation.

Describe the steps of catabolism of phenyl alanine and tyrosine. Add a note on inborn errors associated with them

Metabolism of tryptophan

SHORT ANSWERS

1	Hartnup's disease	Jan 24
2	Discuss the formation of melanin and add a note on albinism	May 22
3	Biochemical defect, clinical features and diagnosis of phenylketonuria.	Sep 21
4	Name the metabolic disorders associated with aromatic amino acids	Aug 18
5	Phenylketonuria	Jul 17
6	Albinism	Feb 16, Aug 13
7	Enzyme defect and abnormal metabolites in phenylketonuria	Feb 16, Aug 12
8	Specialised product of tryptophan	Feb 15
9	What is phenylketonuria and name the enzymatic defect	Aug 14
10	Alkaptonuria	Aug 14
11	Name the biochemical test for phenylketonuria	Aug 12

BIOCHEMISTRY-I

MCQs

multiple response type questions

22	TRUE statements regarding amino acid metabolism are 1) Mousy odor in urine in phenylketonuria is due to excretion of phenylacetyl glutamine 2) Cysteine needs to be supplied in diet in homocystinuria type 1 patients 3) Creatine is synthesized from arginine, glycine and S-adenosyl methionine 4) Leucine and lysine are both ketogenic and glucogenic amino acids a) 1,2,3,4 b) 2,3,4 c) 1,2,3 d) 3,4	Oct 24
23	Choose the correct statements about aromatic amino acids. 1) Defective enzyme in alkaptonuria is homogentisate oxidase 2) Diet restricted in phenylalanine is given for Phenylketonuria 3) Melatonin is synthesised from Tyrosine 4) Phenyl alanine hydroxylase is an iron-containing protein a) All of the above b) 1 & 2 c) 1, 2 & 4 d) None of the above	Jul 24

Old questions (1 mark)

24	Name the neurotransmitters formed from tryptophan	Jan 24, Nov 23
25	Name the limiting amino acids in (a) Pulses (b) Cereals	Jan 24
26	Homogentisic acid is excreted in urine in _____	Jan 24
27	Enzyme defect in - (a) Maple Syrup Urine Disease (b) Albinism.	Jan 24
28	Name aromatic amino acids	Jul 23
29	Name two compounds formed from Tryptophan	May 22
30	Enzyme defect in Alkaptonuria	May 22, Nov 20, Jul 17
31	What are the important substances synthesized from tyrosine.	Feb 22
32	Name the aromatic amino acids	Mar 21
33	Name the vitamin and amino acid formed from tryptophan	Jan 18
34	Biological defect in Hartnup's disease	Aug 18

CITRIC ACID CYCLE, BIOLOGICAL OXIDATION AND ELECTRON TRANSPORT CHAIN

LONG ESSAYS

1	Discuss the reactions of citric acid cycle. Explain its amphibolic role	Aug 18
2	Enumerate the components of electron transport chain. Describe the synthesis of ATP. Indicate the site specific inhibitors. Mention two examples for uncouplers.	Aug 15

SHORT ESSAYS

3	Discuss the structural and functional organization of the electron transport chain. Add a note on its inhibitors	Jan 24
4	Define oxidative phosphorylation. Explain the chemiosmotic theory	Nov 23, Feb 22
5	Explain electron transport chain with a suitable diagram. Add a note on the inhibitors of ETC	Feb 23
6	Enumerate the steps of TCA cycle. Add a note on malate shuttle.	May 22
7	Draw a neat labeled diagram of electron transport chain. Add a note on chemiosmotic hypothesis.	Aug 21

8	Diagrammatic representation of mitochondrial electron transport chain and location of ATP synthesis	Jul 17
9	Chemiosmotic mechanism in ATP synthesis	Feb 16, Aug 12
10	Tricarboxylic acid cycle	Aug 15
SHORT ANSWERS		
11	Chemiosmotic theory	
12	Amphibolic role of TCA cycle	Jul 24, Jan 24
13	Role of cytochrome in ETC	Jul 24
14	What is anaplerosis.	Feb 23
15	Name the inhibitors of electron transport chain and state at what level they act.	Feb 22
16	Inhibitors of ETC	Feb 22
17	Sources of acetyl CoA.	Sep 21, Mar 21, Nov 20
18	Anapleurotic reactions of citric acid cycle	Sep 21
19	Name the inhibitors of ETC and state at what level they act	Nov 20
20	Diagrammatically represent the electron transport chain	Jan 20
21	Anapleurotic role of TCA cycle	Aug 19
22	Uncouplers of oxidative phosphorylation	Jan 19
23	ATP synthesis	Jan 19, Feb 17, Aug 14
24	What is substrate level phosphorylation. Mention one example	Jan 18
		Aug 18, Feb 15, Feb 13

MCQs

multiple response type questions

25	The false statements about citric acid cycle are 1) Enzymes of cycle are in mitochondrial matrix 2) Substrate level phosphorylation occurs through conversion of succinate to fumarate 3) Krebs cycle is both catabolic as well as anabolic, hence called as anapleurotic 4) Fluoroacetate blocks Krebs cycle by inhibiting aconitase a) 1 & 2 b) 2 & 4 c) 2 & 3 d) 2, 3 & 4	Jul 24
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Old questions (1 mark)

26	Name two inhibitors of electron transport chain	Jul 24
27	Total ATP synthesized with one molecule of glucose	Jan 24
28	Give two examples of high energy compounds	Feb 23
29	Anapleurotic reaction	Feb 23
30	Give an example of substrate level phosphorylation	Feb 22
31	Mention two high energy compounds	Aug 18, Feb 15
32	List any four high energy compounds.	Aug 16
33	Name two CO ₂ releasing steps in TCA cycle	Aug 16
34	Why TCA cycle is called amphibolic	Feb 16
35	Name two uncouplers of oxidative phosphorylation	

NUTRITION

FAT SOLUBLE VITAMINS (A,D,E&K)

LONG ESSAYS

1	Discuss vitamin D under the following headings a) source b) daily requirements c) metabolism d) biochemical functions e) deficiency manifestations	Jan 24
2	Explain in detail the active forms, biochemical functions, RDA and deficiency manifestations of Vitamin A with a note on Wald's Visual Cycle	Jan 24
3	Describe the synthesis, biochemical functions, daily requirements, sources and deficiency manifestation of vitamin D.	Jul 23
4	Describe the chemistry, biochemical functions, requirements and deficiency symptoms of vitamin A	Jan 19
5	Describe the chemistry, biochemical functions, daily requirements, sources and deficiency manifestations of vitamin D	Aug 18
6	Describe the sources, RDA, functions and deficiency disorders associated with vitamin D	Jan 18
7	Describe the source, dietary requirements, biochemical functions and deficiency manifestations of vitamin A	Feb 14
8	Describe the sources RDA, biochemical functions and deficiency manifestations of vitamin D	Mar 12

SHORT ESSAYS

9	What are the sources of vitamin A. Enumerate the biochemical role and deficiency manifestations of vitamin A.	May 22
10	Sources, RDA and biochemical functions of vitamin D	Feb 22

SHORT ANSWERS

11	Biological role of Vitamin K	Jul 24, Aug 16
12	Biochemical functions of vitamin A	Nov 23
13	Describe the Wald's visual cycle	Feb 22, Aug 13
14	Functions of vitamin E	Feb 22
15	Rickets	Mar 21
16	Active forms of Vitamin A and the deficiency manifestation	Jul 17
17	Vitamin K Cycle	Feb 17
18	Functions and deficiency manifestations of vitamin E	Feb 17
19	Calcitriol	Aug 14

MCQs

Assertion (A) and Reason (R)

20	(A): When a person moves from bright light to an area of dim light, there is difficulty in seeing (R): Rods are responsible for vision in dim light a) Both A and R are correct but R is not the reason for A b) Both A and R are incorrect	Jul 24
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- c) A Correct R incorrect
d) Both A and R are correct R is reason for A

Old questions (1 mark)

21	Newborns, especially premature infants, have relative vitamin K deficiency. Why?	Jan 24
22	Give RDA for i) Vitamin D ii) Folic Acid	Feb 23
23	Biochemical role of vitamin K in coagulation	Jan 20
24	Anti-haemorrhagic vitamin	Feb 16
25	Active form of vitamin D	Feb 16
26	Clinical features of rickets	Feb 13
27	Pro vitamin and mention one example	Feb 13

WATER SOLUBLE VITAMINS (B COMPLEX & C)

LONG ESSAYS

1	Describe the sources, RDA, functions and deficiency manifestations of ascorbic acid	Sep 21
2	Describe the chemistry, biochemical functions, requirements and deficiency symptoms of vitamin C	Jan 20

SHORT ESSAYS

3	A 22-year-old woman presented with progressive neuropathy for over a few months. She developed numbness and tingling of his hands and feet. Symptoms progressed to difficulty in walking and loss of position sense. For the past 6 years she has stopped eating all nonvegetarian diet including dairy products. Her laboratory results are as follows. Hemoglobin: 10 g/dL, Hematocrit: 47%, Mean corpuscular volume [MCV]: 114fl a) What is the probable micronutrient deficiency the woman is suffering from b) What is the RDA, sources, biochemical functions and lab diagnosis of this micronutrient?	Oct 24
4	Deficiency of folate and Vitamin B12 leads to megaloblastic anaemia, substantiate the statement	Jul 24
5	Describe the source, biochemical functions, and deficiency manifestations of thiamine	Jul 24
6	Enumerate the sources, daily requirement and deficiency manifestation of vitamin C	Feb 23
7	Describe the coenzyme form, sources, biomedical role and deficiency manifestation of thiamine	Aug 21
8	Sources, biochemical functions and deficiency manifestations of niacin.	Mar 21
9	Biochemical functions and deficiency manifestations of vitamin B12	Feb 15
10	Discuss the co-enzyme role of thiamine and the deficiency disorder.	Aug 14
	Discuss the co-enzyme role of thiamine and the deficiency disorder.	Oct 24

SHORT ANSWERS

11	Biochemical basis of- "Anemia in pyridoxine deficiency"	Jul 24
12	FIGLU Excretion Test	Jan 24
13	Scurvy	Nov 23, Aug 21, Mar 21, Aug 19
14	Folate trap	

DECIPHER-I

BIOCHEMISTRY-I

15	Functions of pyridoxal phosphate	Feb 15
16	FIGLU excretion test	Jul 23
17	Beri Beri	Feb 23, Mar 21
18	Functions and deficiency manifestations of thiamine	Feb 23, Nov 20
19	Folic acid antagonists	Feb 22
20	Mention one function and one deficiency manifestation of vitamin B12	Sep 21
21	Name three B complex vitamins and its coenzyme form	Mar 21
22	Functions of vitamin B6	Mar 21
23	Biochemical role of thiamine pyrophosphate	Nov 20
24	Pellagra	Aug 19
25	Functions of thiamine pyrophosphate	Aug 19, Aug 13
26	Folate antagonists	Jan 19
27	Co-enzyme functions of biotin	Jan 19, Feb 14
28	Two co-enzyme roles of NADPH	Aug 18, Aug 12
29	Biochemical functions of thiamine	Jul 17
11	List two reactions where the folic acid is the co-enzyme	Jul 17
12	Name the co-enzyme forms of niacin and write important functions for each one of them	Feb 16, Aug 15

MCQs

single response type questions

13	In a patient on maize diet with diarrhoea, dementia and dermatitis, which vitamin is deficient a) Vitamin B1 b) Vitamin B2 c) Vitamin B3 d) Vitamin B5	Jul 24
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multiple response type questions

14	TRUE about vitamins and their coenzyme functions are 1) Thiamine participates in oxidative decarboxylation reactions 2) Pyridoxine participates in nonoxidative decarboxylation reactions 3) Vitamin C participates in one carbon transfer reaction 4) Niacin participates in hydride ion transfer reactions a) 1,2,3,4 b) 1,2,4 c) 1,3,4 d) 1,2,3	Oct 24
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Assertion (A) and Reason (R)

15	(A): Pellagra like symptoms are seen in patients with carcinoid syndrome (R): Niacin is utilised for serotonin synthesis a) Both A and R are correct but R is not the reason for A b) A incorrect R correct c) Both A and R incorrect d) Both A and R are correct R is reason for A	Oct 24
16	(A): Humans and monkeys can synthesise ascorbic acid (R): Due to presence of enzyme L-gulonolactone hydroxylase a) Both A and R are correct but R is not the reason for A b) Both A and R are incorrect c) A Correct R incorrect d) Both A and R are correct R is reason for A	Jul 24

DECIPHER-I

BIOCHEMISTRY-I

17	(A): Polyneuritis is commonly seen in chronic alcoholics (R): Alcohol metabolism requires thiamine leading to thiamine depletion a) Both A and R are correct but R is not the reason for A b) A incorrect R correct c) Both A and R incorrect d) Both A and R are correct R is reason for A	Jul 24
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Old questions (1 mark)

18	What enzymes are required for regeneration of all-trans retinal	Jul 24
19	Coenzyme form of biotin	Jul 24
20	Coenzyme form of Niacin	Jan 24
21	Name two enzymes that require pyridoxine as coenzyme	Nov 23
22	Name the enzyme activity to assess the deficiency of vitamin B1	May 22
23	List the biological role of vitamin B12	Feb 22
24	Co-enzyme form of biotin	Feb 22
25	Coenzyme form of pantothenic acid	Sep 21
26	Vitamin deficiency in pellagra	Mar 21
27	Why vitamin B1 deficiency causes brain dysfunction.	Jan 20
28	What is the clinical significance of transketolase?	Jan 19
29	Two co-enzyme roles of NADPH	Jul 17
30	Co-enzyme form of pyridoxine	Aug 16
31	Vitamin deficiency in Beriberi	Aug 16
32	List antivitamins and mention one example	Aug 15
33	Co-enzyme functions of biotin	Aug 15
34	Deficiency of vitamin C	Feb 14

MINERAL METABOLISM AND ABNORMALITIES

LONG ESSAYS

1	A patient aged 35 years complains of pain, cramps, tingling sensation in the hands and feet, recurrent carpal spasm. Her past history revealed history of thyroidectomy for goiter. Her blood investigation report is as follows: Serum Creatinine - 1.0 mg %, Serum Calcium -- 4.1mg%, serum Phosphorous -- 5.4 mg %, Albumin -- 4.0 gm%, Alkaline phosphatase --- 60 IU a) What could be your probable diagnosis b) What is the Biochemical Basis for this disorder c) Explain the regulation of plasma levels of Calcium d) Write the normal Reference ranges for Serum Calcium, Serum Phosphorus, serum Creatinine and serum Albumin.	Jul 24
2	DIAGNOSIS: HYPOPARATHYROIDISM Describe the absorption, transport and storage of iron in the body. Explain the regulation of iron homeostasis. Enumerate the biochemical functions of iron. Add a note on disorders associated iron metabolism.	Nov 23
3	35-year-old female, housewife, presented to the medicine department with excessive weakness, breathlessness and palpitations since 3 months. History revealed that she had complaints of excessive menstrual bleeding. She had followed strict vegetarian diet. Investigations revealed her hemoglobin was 7 Gms/dl	Feb 23

DECIPHER-I

BIOCHEMISTRY-I

- What is the probable diagnosis
- Describe the sources, RDA, functions, absorption, transport and deficiency of the mineral involved
- Describe the biochemical investigations and blood picture relevant to this case

4 DIAGNOSIS: IRON DEFICIENCY ANEMIA

SHORT ESSAYS

- | | | |
|----|--|----------------|
| 5 | Many metalloenzymes contains Copper. Write down the reactions catalyzed by copper metalloenzymes. | Oct 24 |
| 6 | Absorption, transport and storage of iron | May 23 |
| 7 | What is the normal serum calcium level. How is it regulated. | May 23, May 22 |
| 8 | What is the normal reference range for serum calcium. How is it regulated. | Feb 22 |
| 9 | Mention the biochemical functions of calcium and describe the blood calcium homeostasis | Aug 21 |
| 10 | Enumerate two hormones which affect Calcium and phosphorus metabolism. Mention how these hormones regulate them in the body. | Mar 21 |
| 11 | Absorption, transport and storage of iron in the body. | Mar 21 |
| 12 | Explain source, RDA, absorption, transport and storage of iron | Mar 21 |
| 13 | Serum Calcium homeostasis | Jan 20, Aug 19 |
| 14 | Explain briefly- absorption, transport and functions of copper | Aug 18 |
| 15 | Mention the normal level serum calcium. Explain the hormonal regulation of serum calcium | Aug 15 |

SHORT ANSWERS

- | | | |
|----|---|--------------------------------|
| 16 | Biochemical test for the investigation of iron deficiency anaemia | Jan 24 |
| 17 | Biochemical functions of Copper and disorders associated with copper metabolism | Jan 24 |
| 18 | Hormonal regulation of calcium level | Nov 23 |
| 19 | Regulation of absorption of iron | Jul 23 |
| 20 | Iron deficiency anemia | Feb 23 |
| 21 | Function of calcium responsible for prevention of tetany | Feb 23 |
| 22 | Mucosal block theory | Feb 23 |
| 23 | Biochemical role of Iron | May 22 |
| 24 | Biochemical role of Copper | May 22 |
| 25 | Trace elements | Feb 22 |
| 26 | Wilson's disease | Sep 21 |
| 27 | State factors affecting calcium absorption | Sep 21 |
| 28 | Biochemical functions of selenium | Sep 21 |
| 29 | Explain the absorption of iron | Aug 21, Jan 18, Jul 17, Aug 13 |
| 30 | Absorption and transport of iron | Nov 20 |
| 31 | Role of zinc | Jan 20 |
| 32 | Wilson's disease | Aug 19, Feb 17 |
| 33 | Transport of iron | Jan 19 |
| 34 | Ceruloplasmin | Feb 18 |
| 35 | Name three factors regulating plasma calcium levels | Jan 18 |

DECIPHER-I

BIOCHEMISTRY-I

- | | | |
|----|--|--------|
| 36 | Fluorosis | |
| 37 | Menke's disease | Jan 18 |
| 38 | Functions of magnesium | Jul 17 |
| 39 | Role of calcitonin in regulation of calcium homeostasis | Aug 16 |
| 40 | Name any two trace elements and mention the biological functions of each of them | Aug 16 |
| 41 | List functions of Selenium | Feb 15 |
| 42 | Mention the Copper containing enzymes | Aug 14 |
| | | Feb 13 |

MCQs

single response type questions

- | | | |
|----|---|--------|
| 43 | Triad of skin pigmentation, diabetes mellitus and liver cirrhosis is seen in
a) Wilson's disease b) Keshan's disease
c) Acrodermatitis d) Hemochromatosis | Oct 24 |
| 44 | Lysyl oxidase enzyme required for cross-links in collagen is dependent on
a) Calcium b) Copper c) Iron d) Magnesium | Oct 24 |

multiple response type questions

- | | | |
|----|--|--------|
| 45 | True about Iron metabolism
1) Vitamin C and cysteine promote Fe absorption
2) Iron elimination does not occur via urine
3) Examples of heme iron-containing proteins are Transferrin and Hemosiderin
4) Iron deposition causing yellow brown pigmentation called as hemochromatosis
a) 1, 2, 3 & 4 b) 1 & 2 c) 1, 2 & 4 d) 2, 3 & 4 | Jul 24 |
|----|--|--------|

Assertion (A) and Reason (R)

- | | | |
|----|--|--------|
| 46 | (A) : Selenium has sparing effect on Vitamin E
(R) : Because selenium participates in free radical scavenging
a) Both A and R are correct but R is not the reason for A
b) A incorrect R correct
c) Both A and R incorrect
d) Both A and R are correct R is reason for A | Oct 24 |
| 47 | (A): Copper is accumulated in liver in Wilson's disease
(R): Disease occurs due to mutation in copper-binding ATPase
a) Both A and R are correct but R is not the reason for A
b) A incorrect R correct
c) Both A and R incorrect
d) Both A and R are correct R is reason for A | Jul 24 |

Old questions (1 mark)

- | | | |
|----|---|------------------------|
| 48 | Name two copper containing enzymes | Nov 23, May 23 |
| 49 | Functions of iodine | May 23 |
| 50 | Two functions of magnesium | Feb 23 |
| 51 | Name any two Zinc containing enzymes | May 22, Aug 21, Jul 17 |
| 52 | Give the normal reference range for serum phosphorous | May 22 |
| 53 | Name any two Iron containing enzymes | Feb 22 |
| 54 | One element involved in wound healing | Mar 21 |

55	Functions of fluoride	Mar 21
56	Name three hormones regulating blood Calcium level	Mar 21, Feb 17
57	Clinical features of fluorosis	Aug 19
58	Mention the Copper containing enzymes	Feb 17
59	Enzyme deficient in Wilson's disease	Aug 16
60	Major storage form of iron	Aug 16
61	What is ceruloplasmin	Feb 15
62	Enumerate functions of Zinc in the body	Aug 14, Feb 13
63	Name the normal serum Calcium level	Aug 12
ENERGY METABOLISM AND NUTRITION		
SHORT ESSAYS		
1	Protein energy malnutrition.	Jul 24
2	Define nitrogen balance. Add a note on the clinical conditions altering	May 22
3	Glycemic index: definition and importance.	Aug 21
4	Causes, clinical features, biochemical manifestations and treatment of kwashiorkor.	Mar 21
SHORT ANSWERS		
5	Define BMR. What are the various factors that influence BMR	Oct 24
6	Describe the biochemical basis of:	Jul 24
7	"Dietary fibre has Hypocholesterolemic effect"	Jan 24
8	Protein energy malnutrition	Nov 23
9	Kwashiorkor	May 23, Feb 23
10	Define dietary fibres. Give suitable examples and their biomedical importance.	Feb 23
11	Marasmus	Aug 12
Old questions (1 mark)		
12	Formula to calculate BMI	Jul 24
13	Define glycemic index and name one food with low glycemic index	May 23
14	Limiting aminoacids	Feb 22
15	Glycemic index	Mar 21
16	Define BMR	Aug 12
GENERAL QUESTIONS		
SHORT ANSWERS		
1	Roles of a physician in health care	Oct 24
2	Briefly explain the Role of a Physician in Health care system.	Jul 24
MCQs		
Assertion (A) and Reason (R)		
3	(A): Mannitol is used to treat head trauma (R): Mannitol is an osmotic diuretic and reduces intracranial pressure a) Both A and R are correct but R is not the reason for A b) A incorrect R correct c) Both A and R incorrect d) Both A and R are correct R is reason for A	Oct 24

BIOCHEMISTRY PAPER-II QUESTIONS MOLECULAR BIOLOGY NUCLEOTIDES : CHEMISTRY AND METABOLISM YEAR

1	A 45-year-old male patient reported to orthopedics outpatient department on Monday morning with pain and swelling of first metatarsophalangeal joint of right foot. He had consumed alcoholic drinks heavily on Saturday night. On examination the first metatarsophalangeal joint of right foot was warm, swollen and tender.	Aug 21
LONG ESSAYS		
2	Describe the salvage pathways for purine and pyrimidine. Explain the biochemical basis of - Lesch-Nyhan syndrome and Von Gierke disease	Feb 16
SHORT ESSAYS		
3	Discuss the salvage pathway of purine synthesis. Add a note on the synthetic nucleotide analogues and their clinical significance	Oct 24
4	Discuss the clinical features, Biochemical basis and diagnosis of Gout	Jul 24
5	What is Gout. Give an account of the causes, biochemical base of clinical manifestations, investigations and management of Gout	Jan 24
6	Catabolism of purines	Jan 24, Jan 19
7	Give the sources of carbon and nitrogen atoms of purine and pyrimidine rings. How is the de novo synthesis regulated. Indicate the clinical uses of inhibitors of purine nucleotide synthesis.	Nov 23
8	Enumerate the steps of purine catabolism.	May 22
9	Add a note on gout.	Feb 22
9	What are the sources for purine ring. Enumerate the reactions in de novo synthesis of purine nucleotide. Add a note on its regulation.	Feb 15
10	How purine nucleotides are degraded.	Feb 15
11	Add a note on abnormalities due to excessive purine catabolism	Aug 15
11	Describe uric acid formation and mention the clinical significance of its estimation	Aug 12
12	Describe the salvage pathway of purine nucleotide synthesis with its significance	Jul 24
SHORT ANSWERS		
13	Gout	Jan 24
14	Orotic aciduria	Feb 15
15	Salvage pathway of purine synthesis	May 23
16	Outline the pathway of purine catabolism	May 23

DECIPHER-I	17	Synthetic nucleotide and its uses.	Feb 23, Jan 19
	18	Mention the origin of carbon and nitrogen atoms in purine ring.	Feb 22
	19	Biochemical basis of allopurinol in treatment of gout	Mar 21
	20	Formation of uric acid	Jan 20, Feb 17, Aug 16, Aug 19
	21	Lesch-Nyhan syndrome	Jan 20, Jul 17
	22	Gout- clinical features and lab diagnosis.	Feb 13
	23	Define gout. Mention the causes of primary gout	Aug 12
	24	Define nucleotide. Name two adenosine nucleotide derivatives	Aug 12
MCQs			
single response type questions			
	25	The disease occurs due to the defect in nucleotide excision repair	Oct 24
	26	(A) Xeroderma pigmentosa (B) Colon cancer (C) Fanconi's anemia (D) Stomach cancer	Oct 24
Assertion (A) and Reason (R)			
	26	(A): Glucose-6-Phosphatase deficiency is a cause of primary Gout (R): Glucose-6-Phosphate is converted to glucose and decreased PRPP a) Both A and R are correct but R is not the reason for A b) A correct R incorrect c) Both A and R incorrect d) Both A and R are correct R is reason for A	Oct 24
Old questions (1 mark)			
	27	Enzyme defect in orotic aciduria	Jul 24, Nov 23
	28	Mention the enzyme deficient in Lesch Nyhan syndrome	May 23, Aug 21, Jan 18
	29	Name two causes of secondary hyperuricaemia	Feb 22
	30	Normal level of serum uric acid	Sep 21
	31	Lesch-Nyhan syndrome	Mar 21
	32	Name two inhibitors of Purine synthesis	Mar 21
	33	What is the difference between DNA and RNA	Aug 18
	34	What are nucleotide analogues and mention one example.	Aug 18
	35	The end product of purine metabolism in human	Aug 16
	36	Name amino acids involved in synthesis of pyrimidine.	Aug 14
DNA: STRUCTURE, ORGANIZATION AND REPLICATION			
LONG ESSAYS			
1	Define replication. Describe in detail the replicative process in prokaryotes with the help of diagrams.	Aug 14	
SHORT ESSAYS			
2	Describe the process of DNA replication in eukaryotes. Name two inhibitors of replication.	Nov 23	
3	What are the principles of DNA replication. Add a note on inhibitors of replication.	Jul 23	
4	Describe the various stages of replication and add a note on DNA repair mechanism.	Feb 22	
5	Structure of B-DNA. Add a note on different types of DNA.	Feb 22	
6	Structure of DNA	Jan 19	

DECIPHER-I	7	Explain DNA repair mechanisms	Aug 18
	8	Describe process of DNA replication	Feb 14
SHORT ANSWERS			
	9	Explain the Watson and Crick model of DNA	Aug 21
	10	DNA polymerases	Aug 19
	11	Base pairing rule	Jan 18
	12	DNA structure	Feb 16
	13	Mitochondrial DNA	Aug 14
	14	Discuss the base repair mechanism of DNA	Aug 13
	15	Define replication and mention four inhibitors of replication.	Aug 12
MCQs			
single response type questions			
	16	Mismatch repair defect is seen in a) Xeroderma pigmentosa b) Hereditary Non polyposis colorectal cancer c) MutyH Polyposis d) Ataxia Telangiectasia	Jul 24
	17	All the following are nucleic acids, EXCEPT a) Plasmids b) Prions c) Cosmids d) Virions	Jul 24
	18	(A): Histones facilitate the packing of DNA into condensed chromatin fibers (R): Histones contain positively charged amino acids arginine and lysine a) Both A and R are correct but R is not the reason for A b) A correct R incorrect c) A incorrect R correct d) Both A and R are correct R is reason for A	Oct 24
Old questions (1 mark)			
	19	Name two conditions caused by defective DNA repair	Jan 23
	20	What is a telomere	Feb 23
	21	Disease associated with DNA repair	Jan 20
	22	Base pairing rule	Jan 19
	23	Name the inhibitors of replication	Aug 18
	24	Name two DNA repair mechanisms	Jul 17, Feb 17
	25	Disorder of defect in mismatch repair	Feb 17
	26	DNA helicase	Feb 13
	27	Xeroderma pigmentosum is due to deficiency of ?	Feb 13
TRANSCRIPTION AND TRANSLATION			
LONG ESSAYS			
1	What is translation. Describe the steps of translation leading to protein synthesis in detail. Give a brief note on the inhibitors of protein synthesis.	Jul 24	
2	Define and explain the steps involved in the process of Translation. What is Post Translational modifications, Give four examples	Jul 24	
3	Describe the process of eukaryotic translation. Add a note on post-translational modifications and inhibitors of translation.	Jan 24	
4	Give a detailed account of the transcription process. How is it regulated.	Jan 24	
5	Name inhibitors of transcription	Feb 23	
	5	Explain the steps of Transcription in Eukaryotes with a note on inhibitors	Feb 23

DECIPHER-I

BIOCHEMISTRY-II

	of transcription.	
6	Definition steps and inhibitors of translation	Feb 23
7	Define translation. Describe the steps of Translation. Add a note on its inhibitors	May 22
8	Describe the process of transcription by providing the details on the following - Requisites, Promoters, Pre-initiation complex, Initiation, Elongation and termination, Inhibitors, Post-transcriptional modifications	Feb 22
9	Write the definition, steps and inhibitors of transcription	Aug 21
10	Define transcription. Steps of transcription in prokaryotes. Post transcriptional modification. Inhibitors of transcription.	Mar 21
11	Discuss the process of translation and add a note on post translational modifications	Aug 17
12	Define transcription and explain in detail the transcription in prokaryotes. Add a note on post transcriptional modification	Aug 16
13	Describe the process of transcription. What are the posttranscriptional modifications? Mention two inhibitors of transcription	Aug 15
14	What is transcription? Enumerate the steps in transcription and add a note on post transcriptional modifications	Feb 15
15	Describe how protein is synthesized in body. Name any two inhibitors of protein biosynthesis. Add a note on post translational modifications	Feb 13
SHORT ESSAYS		
13	Genetic code	Jan 24, Feb 16
14	Diagrammatically represent the structure of trna. Describe the functions of tRNA	Feb 23
15	Post transcriptional modifications.	Aug 19
16	Describe post transcriptional modifications and its significance with examples	Jan 18
17	Discuss the process of transcription in prokaryotes	Feb 14
18	Describe the structure and function of tRNA	Aug 12
SHORT ANSWERS		
19	What is code. Describe the salient features of genetic code	Jan 24
20	Post translational modifications	Nov 23, Sep 21, Feb 17
21	What are the different types of RNA. Add a note on function of tRNA.	Jul 23
22	tRNA	Feb 23
23	Contractile proteins	Feb 23
24	Structure of tRNA and its function	Feb 22
25	Introns and exons.	Feb 22
26	Explain genetic code. What are salient features of genetic code.	Mar 21
27	Genetic code	Nov 20, Feb 15
28	Inhibitors of translation	Aug 19
29	Reverse transcriptase	Jul 17, Aug 14
30	Enumerate three post translational modifications of proteins with one example each	Feb 16
31	Wobble hypothesis	Aug 14

MCQs

DECIPHER-I

BIOCHEMISTRY-II

multiple response type questions

- The following statements about genetic code are true.
 1)AUG is the initiator codon 2)UAG is a stop codon
 3)Glycine has only one codon 4)Arginine has two codons
 a)2&3 b)1&2 c)3&4 d)1&4

Oct 24

Assertion (A) and Reason (R)

- (A): Streptomycin is a bactericidal antibiotic
 (R): It binds to 30S subunit of bacterial ribosome and inhibits protein synthesis
 a) Both A and R are correct but R is not the reason for A
 b) A correct R incorrect
 c) A incorrect R correct
 d) Both A and R are correct R is reason for A

Oct 24

Old questions (1 mark)

34	Mention two post translational modifications	Jul 24, Feb 23, Feb 22, Aug 21
35	Action of reverse transcriptase	Jan 24
36	Name two inhibitors of translation	Jan 24
37	What is genetic code.	Jan 24
38	Name two inhibitors of RNA synthesis	Nov 23
39	What is the role of Telomerase enzyme	May 23
40	Degeneracy of genetic code	May 23
41	Reverse transcriptase	Feb 23
42	Give two features of genetic code	May 22, Aug 21
43	Give an example of post transcriptional modification	May 22
44	Wobble hypothesis	Feb 22, Jul 17
45	Functions of t-RNA	Feb 22
46	Promoter region	Sep 21
47	Name RNA with catalytic activity.	Aug 21
48	Mention the function of spliceosomes.	Jan 18
49	Genetic code	Aug 12

INHERITANCE, MUTATION, CELL CYCLE AND CONTROL OF GENE EXPRESSION

LONG ESSAYS

- 1 Mention the salient features of genetic code. Discuss in detail about the various types of mutation

Feb 17

SHORT ANSWERS

- 2 What is mutation. Describe point mutation and frameshift mutation
- 3 Causes of mutations
- 4 Define mutations
- 5 Define point mutations and types with one example
- 6 Lac operon
- 7 Effects of mutation
- 8 Point mutation
- 9 Apoptosis
- 10 Frame shift mutation.

Jul 23

Sep 21

Aug 21

Nov 20

Aug 19

Jan 19

Aug 18, Aug 12

Jul 17

Aug 12

MCQs

DECIPHER-I

BIOCHEMISTRY-II

Old questions (1 mark)

11	Define mutation	Jan 24
12	Define apoptosis	Jan 24, Nov 23
13	Name two antimutagens	Nov 23
14	Mutagens	Mar 21
15	Mention the examples of partially acceptable missense mutation and unacceptable missense mutation	Feb 14
16	Frame shift mutation	Aug 13
17	Examples of point mutation	Feb 13

RECOMBINANT DNA TECHNOLOGY AND GENE THERAPY

SHORT ESSAYS

1	Describe recombinant DNA technology. What are the applications of the technique.	Jan 24, Nov 23
2	Enumerate the applications of recombinant DNA technology. Add a note on vectors	Aug 21
3	Recombinant DNA technology and its applications.	Nov 20
4	Applications of recombinant DNA technology	Jan 20

SHORT ANSWERS

5	Gene therapy	Oct 24, Feb 23, Nov 20, Feb 14
6	Give reason: "Plasmids are used commonly as vectors in recombinant DNA techniques"	Jul 24
7	Restriction endonuclease	Feb 17
8	Four applications of recombinant DNA technology	Aug 16
9	Restriction enzymes	Feb 15
10	List the restriction endonucleases and mention its uses	Feb 13

MCQs

multiple response type questions

11	Regarding gene therapy choose the correct statement 1) In ex-vivo strategy, patients' cells with modified genes are administered to the patient 2) In in-situ strategy, expression cassette is introduced to the patients' blood or tissue 3) In in-vivo strategy, vector is administered to the cells or tissues 4) Somatic gene therapy is being tried a) 1 & 2 b) 1, 2 & 3 c) 1, 3 & 4 d) All are correct	Jul 24
12	Choose the correct statement about plasmids 1) They are circular single-stranded RNA 2) Replicate independent of bacterial DNA replication 3) Specialised regions of bacterial chromosomes 4) Confer antibiotic resistance to host bacteria a) 1 & 2 b) 1, 3 & 4 c) 2 & 4 d) 2, 3 & 4	Jul 24

Old questions (1 mark)

13	Name two vectors used in gene therapy	Jan 24, Mar 21
14	Molecular scissors	Jul 17

DECIPHER-I

BIOCHEMISTRY-II

15	First pharmaceutical product of recombinant DNA technology for human use	Feb 16
16	List the functions of restriction endonucleases	Aug 13

MOLECULAR DIAGNOSTICS

SHORT ESSAYS

1	Explain the different steps in PCR. Add a note on its applications	Oct 24
2	Describe PCR and its applications. Add a note on its significance in diagnosis covid-19	Feb 23
3	Steps and applications of polymerase chain reaction	Mar 21

SHORT ANSWERS

4	RFLP (Restriction Fragment Length Polymorphism)	Oct 24
5	PCR (Polymerase Chain Reaction)	Jul 24, Aug 14
6	Applications of PCR (Polymerase Chain Reaction)	Jan 24
7	Western blot technique	Feb 23, Feb 17
8	Name various blotting techniques and their significance	Mar 21
9	Uses of restriction fragment length polymorphism (RFLP)	Jan 20
10	Mention two applications of polymerase chain reaction	Aug 18
11	Southern blot technique	Jul 17
12	DNA fingerprinting	Aug 13
13	Mention the principles and application of polymerase chain reaction	Feb 13

MCQs

Assertion (A) and Reason (R)

14	Assertion(A): Restriction fragment length polymorphism can be used to settle cases of disputed parenthood Reason (R): Both chromosomes of a pair show similar restriction pattern a) Both A and R are correct b) A incorrect R correct c) Both A and R are incorrect d) A correct R incorrect	Jul 24
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Old questions (1 mark)

15	Enlist two applications of Southern blotting technique	Nov 23
16	Mention any two applications of PCR	May 22, Aug 21

CLINICAL AND APPLIED BIOCHEMISTRY

LIVER AND GASTRIC FUNCTION TESTS

LONG ESSAYS

1	42-year-old obese lady presented with intolerance to fatty foods and pain in right abdominal region. On examination, her eyes were yellowish; stools had clay-colored appearance. Her investigations revealed the following Serum bilirubin-18 mg/dl, Direct bilirubin-17 mg/dl, AST-35 IU/L, ALT-40 IU/L, ALP-400 IU/L •What is the probable diagnosis •What is the normal serum Bilirubin level •Describe the catabolism of Heme •What is the biochemical basis of clay colored stools •What will be the probable urinary findings in this patient	May 23
2	A 42-year old obese lady presented with pain abdomen. She also	May 21

DIAGNOSIS: OBSTRUCTIVE JAUNDICE

DECIPHER-I

BIOCHEMISTRY-II

complaints of passing clay coloured stool on examination there was yellowish discoloration of skin.

- What is the diagnosis.
- Describe the laboratory findings in hemolytic, hepatocellular and obstructive jaundice.
- Van den Bergh reaction.

DIAGNOSIS: OBSTRUCTIVE JAUNDICE

- 3 A 70-year-old male presented to his family physician with yellow discoloration of sclera associated with epigastric pain and weight loss. Urine had become darker in color and his stools pale. A CT scan of the abdomen revealed a tumor in the pancreas. Investigations: Total Bilirubin - 4.2mg/dl; Direct Bilirubin - 3.8mg/dl; ALP - 510U/L; AST - 80U/L; ALT - 76U/L. Answer the following using the above data:
- What is the probable diagnosis
 - Define and classify Jaundice
 - Which enzyme is specific for this type of jaundice and why
 - Explain the urinary findings
 - Why urine is dark in color and stools pale
 - Enumerate the causes of jaundice
 - List the laboratory investigations used to differentiate between the types of jaundice.

DIAGNOSIS: OBSTRUCTIVE JAUNDICE

- 4 Explain bilirubin formation and excretion in detail. Describe the biochemical changes in hepato-cellular and obstructive jaundice.

SHORT ESSAYS

- 5 A 57-year-old woman presented at clinic with intense jaundice, pruritus and hepatomegaly with abnormal liver function tests-Total bilirubin-12 mg/dl, Conjugated bilirubin- 10 mg/dL, unconjugated bilirubin- 2 mg/dl Serum ALP=826 U/L
- What is the probable diagnosis
 - Discuss the causes and lab findings for the above condition

DIAGNOSIS: OBSTRUCTIVE JAUNDICE

- 6 A patient gave history of recurrent episodes of vomiting and fever. On examination he was icteric, dehydrated and his liver was palpable. Following is the biochemical report of this patient:
S. total Bilirubin- 12 mg%, conjugated bilirubin - 5.5 mg %, unconjugated bilirubin - 6.5 mg %, S. Alkaline phosphatase - 278 IU /L, AST - 235 IU/L, ALT - 365 IU/ L, Bile salts - Negative, Bile Pigments - positive, Fecal stercobilinogen - positive.
- What could be your probable Diagnosis
 - Explain how Bilirubin is formed and excreted from the body

DIAGNOSIS: HEPATOCELLULAR JAUNDICE

- 7 Enumerate liver function tests. Describe any two of them in detail

SHORT ANSWERS

- 8 Discuss the biochemical alterations seen in blood and urine in hepatocellular jaundice
- 9 Urinary picture of different types of Jaundice

DECIPHER-I

BIOCHEMISTRY-II

- 10 Van den Bergh test
- 11 Differential diagnosis of jaundice by laboratory tests
- 12 Fatty liver
- 13 Clinical significance of ALP
- 14 Liver function tests
- 15 What is post hepatic jaundice and how it is diagnosed biochemically

MCQs

multiple response type questions

- 16 The following statements regarding hemolytic jaundice are true
- 1) Increased levels of serum unconjugated bilirubin
 - 2) Increased excretion of unconjugated bilirubin in urine
 - 3) Increased Urobilinogen excretion in urine
 - 4) Increased levels of serum conjugated bilirubin
- a) 1 & 3 b) 2&4 c) 1 & 2 d) 3&4
- 17 The laboratory data that is against a diagnosis of obstructive jaundice is
- 1) High alkaline phosphatase level
 - 2) Increased excretion of urobilinogen in urine
 - 3) Elevated serum cholesterol level
 - 4) Indirect positive van den Bergh reaction
- a) 2 & 4 b) 2 & 3 c) 3 & 4 d) 1, 2 & 4

Assertion (A) and Reason (R)

- 18 Assertion(A): In hepatic jaundice, Hay's test will be positive
Reason (R): Hay's test is used to detect conjugated bilirubin
- Both A and R are correct R is the reason for A
 - A correct R incorrect
 - Both A and R are incorrect
 - Both A and R are correct R is not the reason for A

Old questions (1 mark)

- 19 What is the most common cause of hepatocellular jaundice
- 20 Two enzyme markers of hepatocellular jaundice
- 21 Clinical importance of acid phosphatase and alkaline phosphatase
- 22 Enzyme marker of hepatic jaundice
- 23 Significance of hippuric acid excretion test
- 24 Clinical significance of bile salts

KIDNEY FUNCTION TESTS

SHORT ESSAYS

- 1 Name the renal clearance tests. Give details of any one of them. What is its clinical significance
- 2 Classify renal function tests. Describe clearance tests in detail
- 3 Creatinine clearance and its clinical significance.

SHORT ANSWERS

- 4 Discuss about the different types of proteinuria in detail.
- 5 Creatinine clearance
- 6 Creatinine clearance tests and its significance.
- 7 Creatinine clearance test

DECIPHER-I

BIOCHEMISTRY-II

8	Define clearance and how it is estimated? Add a note on its diagnostic importance	Jan 18, Feb 16
9	Urea clearance test	Feb 15

MCQs

single response type questions

10	Normal reference level of Blood urea a) 3-5mg/dL b) 20-40mg/dL c) 75-100mg/dL d) 135-145 mg/dL.	Oct 24
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Assertion (A) and Reason (R)

11	Assertion (A): Creatinine clearance is a better index than urea clearance Reason (R): Creatinine clearance is not affected by dietary protein Consumption a) Both A and R are correct but R is not the reason for A b) A incorrect R correct c) Both A and R are incorrect d) Both A and R are correct, R is the reason for A	Jul 24
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Old questions (1 mark)

12	Define Creatinine clearance	Jul 23
13	A patient presented with excretion of urine more than 20 litres per day. Specific gravity of his urine sample was 1.002 What is your diagnosis.	May 23
14	Reference level of serum creatinine	May 23
15	Reference level of S. creatinine and blood urea.	Feb 22
16	Give the names of compounds used for estimating clearance	Feb 22
17	Creatine kinase	Mar 21
18	Creatinine clearance test	Nov 20
19	Mention the normal level of serum creatinine	Aug 18, Aug 14
20	Normal blood level of urea and glucose	Feb 17

PLASMA PROTEINS

SHORT ESSAYS

1	Electrophoresis	Feb 23
2	Plasma proteins and its functions	Sep 21

SHORT ANSWERS

3	A/G ratio	Mar 21
4	Serum electrophoresis and its clinical importance	Nov 20
5	Functions of albumin	Jan 20, Feb 16
6	Albumin	Aug 18
7	List the functions of plasma proteins	Feb 16, Aug 13
8	Explain why edema develops in hypoalbuminemia	Aug 15

MCQs

Old questions (1 mark)

9	Fastest moving plasma protein in electrophoresis ?	May 23
10	Mention the acute phase reactants	Feb 23, Jul 17
11	Microalbuminuria	Feb 23
12	Two conditions causing reversal of albumin globulin ratio	May 22
13	Given the normal albumin : globulin ratio	Feb 22, Jan 18
14	Mention any two applications of Electrophoresis	Feb 22

DECIPHER-I

BIOCHEMISTRY-II

15	Normal value of serum total protein	Jan 20
16	Name the serum albumin level and two conditions where serum albumin is decreased.	Aug 14
17	The normal albumin-globulin ratio and mention a condition in which it is reversed	Aug 13
18	Normal level of serum albumin	Aug 12

ACID-BASE BALANCE AND pH

LONG ESSAYS

1	An unconscious patient was rushed to the Emergency department of the hospital. History taken from the attendant revealed that patient was a known Diabetic, blood samples were collected and sent to clinical laboratory for analysis. a) What could be your probable diagnosis b) Which relevant investigations you would suggest for this patient c) Explain the role of Kidneys in maintenance of Acid base homeostasis d) How is the compensation brought about in this patient	Jul 24
2	A 68-year-old man, known diabetic for the past 20 years was brought to the emergency in a disoriented state. Relatives informed that he had fever for the last few days and skipped his regular doses of insulin. On examination he had rapid pulse and rapid deep breathing. Laboratory results as follows: pH: 7.2, HCO ₃ ⁻ : 12 meq/L, PCO ₂ : 35mm of Hg, Na ⁺ : 135meq/L, K ⁺ : 4.9meq/L, Cl ⁻ : 101meq/L a) What is the most likely acid base disorder in this patient b) Calculate anion gap and comments c) Interpret the given laboratory parameters and give their reference interval d) Enumerate the causes for this type of acid base imbalance e) Describe the role of lungs and kidney in maintaining normal plasma pH	Jan 24
3	DIAGNOSIS : HIGH ANION GAP METABOLIC ACIDOSIS A 54-year-old man was admitted to emergency in a disoriented state. He had a feeble pulse, low blood pressure and sweetish odour of breath. Arterial blood gas analysis showed : pH : 7.1, HCO ₃ ⁻ : 11 mmol/L, pCO ₂ : 38 mmHg. a) What is the most likely acid base disorder in this case b) Interpret the ABG findings and give the normal reference interval c) Give four causes for the above acid base disorder d) Enumerate the major buffer systems in the body e) Discuss the renal regulatory mechanisms of acid base balance	Nov 23
4	DIAGNOSIS : METABOLIC ACIDOSIS A 20 years old young man was brought to casualty with road traffic accident. He sustained injury to chest wall. ABG analysis showed pH 7.25, pCO ₂ 54 mm Hg, HCO ₃ ⁻ is 23 mEq/L. • Explain the mechanism of maintaining Blood pH. • What is the diagnosis • What is the biochemical change in these disorders • Define the other acid base balance disorders	Mar 21

DECIPHER-I

BIOCHEMISTRY-II

DIAGNOSIS : RESPIRATORY ACIDOSIS.

5	What is the normal pH of blood. Describe in detail about the respiratory and renal regulation of blood pH and add a note on metabolic acidosis.	Nov 20
6	Discuss in detail the mechanism by which kidney maintains the blood pH. What is meant by metabolic acidosis and how it is compensated	Aug 13

SHORT ESSAYS

7	What are the various renal mechanisms involved in regulation of blood pH	Oct 24
8	Renal regulation of acid base balance	Jul 24
9	What is the role of buffers in regulating blood pH	May 23
10	What are the causes, biochemical findings and compensatory mechanisms in metabolic acidosis	May 23
11	Metabolic acidosis	Feb 23, Jan 18, Aug 16, Aug 15, Feb 13, Aug 12
12	Explain renal regulation of maintaining blood pH	May 22
13	Define metabolic alkalosis. What are the characteristic features and causes of metabolic alkalosis. Mention the compensatory mechanisms.	Feb 22
14	Define metabolic acidosis. What are the characteristic features and causes of metabolic acidosis. Mention the compensatory mechanisms.	Aug 21
15	Role of kidney in regulation of plasma pH	Aug 18
16	Plasma buffers	Feb 17
17	Explain briefly on blood buffers and add a note on renal mechanism of maintaining acid base balance	Feb 14

SHORT ANSWERS

18	Give reason- " High anion gap metabolic acidosis in renal failure"	Oct 24
19	Anion gap	Jul 24
20	Respiratory Regulation of Blood pH	Jan 24
21	What is the role of kidney in the regulation of pH	Jul 23
22	Metabolic acidosis	Mar 21
23	Define anion gap and mention its normal range	Mar 21
24	Respiratory acidosis	Jan 19, Feb 15
25	What is respiratory acidosis and mention one example	Aug 18
26	Plasma pH	Feb 16
27	Difference between metabolic acidosis and respiratory acidosis	Aug 14
28	Explain the role of kidney in acid base regulation	Feb 13

MCQs

case scenario-based questions

29	45 year old John was rushed to the hospital due to vomiting and a decreased level of consciousness. The patient displays slow and deep (Kussmaul breathing), and he is lethargic and irritable in response to stimulation. He appears to be dehydrated- his eyes are sunken and mucous membranes are dry-and he has a two-week history of polydipsia, polyuria, and weight loss. Measurement of arterial blood gas shows pH=7.0, PaO ₂ = 90 mmHg, PaCO ₂ = 41 mmHg, and HCO ₃ = 12 mmol/L: other results are: Na+: 126 mmol/l, K+: 5 mmol/l, and Cl-: 95 mmol/L. What is your assessment	Oct 24
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DECIPHER-I

BIOCHEMISTRY-II

- The probable diagnosis for the above condition of John will be
 - Respiratory Acidosis
 - Respiratory Alkalosis
 - Metabolic Alkalosis
 - Metabolic Acidosis
- High anion gap metabolic acidosis is observed in the following condition
 - Renal tubular acidosis
 - Diabetic ketoacidosis
 - Diarrhoea
 - Vomiting
- The predominant buffer system of plasma is
 - Phosphate
 - Bicarbonate
 - Haemoglobin
 - Protein
- Which one of the following condition does not cause metabolic alkalosis
 - Persistent vomiting
 - Hyperaldosteronism
 - Severe diarrhoea
 - Thiazide diuretics
- Hypokalemia occurs in
 - Acidosis
 - Alkalosis
 - Both of the above
 - None of the above

Old questions (1 mark)

30	Mention two causes of metabolic alkalosis	Jan 24
31	What is the reason for hyperkalaemia in metabolic acidosis	Jul 23
32	Two causes of respiratory acidosis	Feb 23, Aug 21
33	Normal value of anion gap	May 22, Sep 21
34	Define metabolic acidosis	May 22
35	Henderson Hasselbach equation	Mar 21
36	Anion gap	Aug 19
37	Important buffer in intracellular fluid	Aug 16

WATER BALANCE, ELECTROLYTE BALANCE AND BODY FLUIDS

SHORT ANSWERS

1	Give reason- "Low salt diet is recommended in patients with hypertension"	Jul 24
2	Explain the Biochemical basis of : "Hyperkalemia is a life threatening situation"	Jul 24
3	Hyperkalemia	Jan 24, Feb 22
4	Normal values of serum electrolytes - Sodium, potassium, bicarbonates and chloride	Jan 19
5	Distribution of total body water	Aug 18
6	Mention the normal sodium level and clinical manifestation of hyponatremia	Aug 15
7	What is the normal serum level range of sodium and potassium	Feb 14

MCQs

single response type questions

8	Which of the following is NOT an emergency investigation - Potassium - Fasting glucose - Creatinine - Calcium	Jul 24
9	Normal serum potassium and sodium	Jan 24, May 23, Feb 23, Mar 21
10	Hyperkalaemia is treated by giving glucose and insulin. Why	Nov 23
11	Give the reference interval in plasma to (a) Sodium (b) Chloride	Nov 23
12	Give the normal reference range for serum potassium	May 22
13	Give biological reference range for serum sodium	Aug 21, Feb 15

Old questions (1 mark)

DECIPHER-I

- 14 Hypokalemia
15 Hyponatremia

FREE RADICALS AND ANTIOXIDANTS

SHORT ESSAYS

- 1 Antioxidants definition and classification

SHORT ANSWERS

- 2 Name the types of antioxidants and discuss their role in scavenging of free radicals.

- 3 Chain breaking and Preventive antioxidants
4 Name two antioxidants
5 Reactive oxygen species
6 Free radicals
7 Antioxidants

- 8 Effects of free radicals

- 9 Vitamins with antioxidant function

MCQs

multiple response type questions

- 10 Which of the following diseases are not attributed to free radical injury
1) Hypothyroidism 2) Cataract
3) Reperfusion injury 4) Type II Diabetes Mellitus
a) 1 & 2 b) 1 & 4 c) 2 & 4 d) 2 & 3

Assertion (A) and Reason (R)

- 11 (A): In chronic granulomatous disease, macrophages ingest bacteria normally but cannot destroy them
(R): NADPH oxidase is absent in macrophages & neutrophils
a) Both A and R are correct but R is not the reason for A
b) A incorrect R correct
c) Both A and R incorrect
d) Both A and R are correct R is reason for A

Old questions (1 mark)

- 12 Give two examples of preventive antioxidants
13 Two enzymes as antioxidants
14 What are antioxidants

DETOXIFICATION AND BIOTRANSFORMATION OF XENOBIOTICS

SHORT ESSAYS

- 1 Phase I detoxification reaction
2 Define Detoxification. Mention four reactions of Phase 2 detoxification.
3 Detoxification by conjugation

SHORT ANSWERS

- 4 Role of Glucuronic acid in Detoxification
5 Detoxification by conjugation
6 Conjugation phase of Detoxification
7 Give two examples for Phase II detoxification reaction.
8 Explain detoxification. Explain different phases of detoxification.

BIOCHEMISTRY-II

Nov 20
Aug 19

DECIPHER-I

- 9 Phase-I reactions of detoxification

- 10 Mention two examples for detoxification by reduction

- 11 One example each of detoxification by oxidation and conjugation

- 12 How benzoic acid and sulphonylamide are detoxified in human body

- 13 Cytochrome P450

MCQs

Assertion (A) and Reason (R)

- 14 Assertion(A): Cytochrome P450 is the chief enzyme responsible for clearance of majority of drugs
Reason(R): Cytochrome P450 catalyses through conjugation
a) Both A and R are correct but R is not the reason for A
b) A correct R incorrect
c) Both A and R are incorrect
d) Both A and R are correct R is the reason for A

Old questions (1 mark)

- 15 Which amino acids are used for detoxification.
16 Role of cyt p450 in detoxification
17 Benzoic acid is detoxified by _____
18 How glycine is used in detoxification reactions.

GENERAL METABOLISM

HEME AND HEMOGLOBIN

LONG ESSAYS

- 1 Describe the formation and excretion of bilirubin. Explain the significance of serum bilirubin and urobilinogen in the diagnosis of various types of jaundice

- 2 Describe heme synthesis and its regulation in detail.

SHORT ESSAYS

- 3 Discuss the biochemical alterations seen in blood and urine in different types of jaundice.
4 Mention the types of Porphyrrias with their enzyme defects
5 Outline the pathway of heme synthesis. Mention its regulation.
6 Describe how heme is degraded into bile pigments. Add a note on different types of Jaundice
7 How is heme synthesized. Add a note on its regulation
8 What is thalassemia. Discuss the clinical features, molecular basis and laboratory diagnosis of thalassemia
9 Discuss the catabolism of heme. Describe the causes and laboratory finding in obstructive jaundice
10 Define porphyria. Classify porphyria and enumerate their salient features. Add a note on acute intermittent porphyria.
11 Molecular basis, clinical features and diagnosis of sickle cell anaemia
12 Catabolism of heme

BIOCHEMISTRY-II

Jul 17, Feb 17
Aug 16
Feb 16, Feb 15,
Feb 13
Aug 15
Aug 13

DECIPHER-I

BIOCHEMISTRY-II

13	Porphyrias	Jan 18
14	Thalassemia	Feb 17
15	Explain the degradation of heme	Aug 13
16	Outline the degradation of heme. Add a note on fate of conjugated bilirubin in intestine	Feb 13
17	Porphyrias presenting with photo sensitivity	Aug 12
SHORT ANSWERS		
18	Give reason- "Iron overload in Thalassemia"	Oct 24
19	Give biochemical basis of: a) "Anaemia in lead poisoning" b) "Sickling of RBC in Sickle cell Anaemia"	Oct 24
20	Regulation of heme synthesis	Jul 24
21	Detoxification of bilirubin	Jan 24
22	Vandenberg test	Feb 23
23	Acute intermittent porphyria	Feb 22, Nov 20, Jan 20, Feb 17, Aug 15, Feb 15
24	Molecular basis and diagnosis of sickle cell anemia	Feb 22
25	List two clinical conditions of abnormal haemoglobin	Mar 21
26	Biochemical basis of thalassemia	Jan 20
27	Significance of 2,3-BPG	Jan 19
28	Chloride shift	Aug 18, Jan 18
29	Vanden Berg reaction	Jan 18
30	Unconjugated hyperbilirubinemia	Jul 17
31	Abnormal haemoglobins	Feb 17
32	Obstructive jaundice	Aug 16
33	Blood and urinary findings in various types of jaundice	Aug 14
34	Congenital erythropoietic porphyria	Aug 14
35	Define thalassemia and mention the different types of thalassemia	Feb 14, Aug 12
36	Causes and clinical features of acute intermittent porphyria	Aug 12

MCQs

multiple response type questions

37	Select the incorrect pairs 1) Congenital erythropoietic porphyria- urine portwine colour 2) Congenital erythropoietic porphyria- Autosomal dominant 3) Hereditary protoporphyria- Ferro chelatase deficient 4) Acute intermittent porphyria- photosensitivity present a) 1&3 b) 2&4 c) 1&2 d) 3&4	Oct 24
38	The following are Congenital Hyperbilirubinemia with increase in unconjugated bilirubin levels in blood. 1) Crigler-Najjar Type 1 2) Crigler-Najjar Type 2 3) Gilbert's disease 4) Dubin- Johnson Syndrome a) 2, 3, 4 b) 1, 2, 3 c) 1, 2, 4 d) 1, 3, 4	Oct 24

case scenario-based questions :

39	A 15-year old African boy studying in India was admitted to the medical ward with complaints of fever and severe body pains. On examination,	Jul 24
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DECIPHER-I

BIOCHEMISTRY-II

hepatosplenomegaly was detected. His Hb levels were found to be very low (6.5g/dL). Microscopic examination of his blood smear revealed sickle-shaped RBC

i. Molecular basis of HbS is

- Normal 2 α and 2 β globin chains
- Normal 2 α and abnormal 2 β globin chains
- Abnormal 2 α and normal 2 β globin chains
- Abnormal 2 α and 2 β globin chains

ii. In HbS, which of the following is true.

- Valine replaced by glutamate
- Valine replaced by glycine
- Glutamate replaced by valine
- Glycine replaced by valine

iii. In sickle cell disease, sickling of RBCs is favorable when hemoglobin S is in

- Oxygenated form
- Deoxygenated form
- Glycated form
- Oxidized form

iv. All the below complications can occur for the boy EXCEPT

- Vasocclusive crisis
- Organ damage
- Bleeding disease
- Pain and swelling in joints

v. Regarding HbS and HbA all are true EXCEPT

- Inclusion bodies will be seen both in HbS and HbA
- Solubility of deoxy HbS is lower than deoxy HbA
- HbS is slower moving on electrophoresis than HbA
- Structural difference is with regard to beta chain

Old questions (1 mark)

40	Name the enzyme defect in acute intermittent porphyria	Jan 24
41	Which enzyme deficiency causes congenital erythropoietic porphyria	Jul 23
42	Name the rate limiting enzyme of heme synthesis	May 22
43	Enzyme defect in acute intermittent porphyria	Mar 21
44	Rate limiting enzyme of heme synthesis	Mar 21
45	Beta thalassemia	Nov 20
46	Normal serum bilirubin level	Jan 19
47	Compound that facilitates the release of O ₂ from oxyhaemoglobin	Feb 13

ADVANCED BIOCHEMISTRY

MECHANISM OF ACTION OF HORMONES IMMUNOCHEMISTRY

LONG ESSAYS

- A 53-year-old woman came to OPD with history of weight gain, constipation, weakness and cold intolerance. On examination she had a neck swelling. The following thyroid function tests were done, with the reports as given below :
TSH- 54.6 mU/L (0.20-5.0), Free T₄ (FT₄)- 5.7 pmol/L (12-25 pmol/L)
a) Write the probable diagnosis
b) Explain the laboratory assessment of the endocrine gland in detail
c) Give a brief account of the disorders related to the gland

DIAGNOSIS : HYPOTHYROIDISM

- Structure, type and functions of immunoglobulin

DECIPHER-I

BIOCHEMISTRY-II

SHORT ESSAYS

3	Explain the different types of immunoglobulins. Add a brief note on Multiple myeloma	Oct 24
4	Thyroid function tests and their significance	Jul 24
5	Differentiate between active and passive immunity	Jul 24
6	Enumerate the immunoglobulin and classify their functions. Describe the structure of immunoglobulins.	Nov 23
7	Discuss the structure and functions of immunoglobulin. Add a note on monoclonal antibodies	Feb 23
8	Primary and secondary immune response	Feb 22
9	Describe the structure and functions of Immunoglobulins	Aug 21, Aug 16, Aug 14
10	What are different types and functions of immunoglobulins	Mar 21

SHORT ANSWERS

11	Enumerate different immunoglobulins. Describe the structure of immunoglobulin	Jul 24
12	Immunoglobulin E and its significance	Jul 23
13	Ig G	May 22
14	Passive immunity	May 22
15	Role of cytokines in immunity	Aug 21
16	Functions of immunoglobulin	Jan 19
17	Structure of immunoglobulin	Aug 18, Feb 14
18	Two clinical conditions of hypergammaglobulinaemia	Feb 16
19	Explain the structure of IgG molecule and indicate its functions	Feb 13

MCQs

single response type questions

20	All the following statements about a live attenuated vaccine are true, EXCEPT a) A single dose is sufficient b) It induces shorter but effective immunity c) It induces humoral and cell-mediated immunity d) It can be administered by the route of natural infection to induce local immunity	Jul 24
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multiple response type questions

21	The following are examples of inactivated vaccines 1) Polio 2) Covaxin 3) Covishield 4) Diphtheria a) 2&3 b) 1&2 c) 3&4 d) 1&4	Oct 24
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Assertion (A) and Reason (R)

22	(A): In Addison's disease, there is hyperpigmentation of Both skin (R): Plasma cortisol levels are low a) Both A and R are correct but R is not the reason for A b) A correct R incorrect c) A incorrect R correct d) Both A and R incorrect	Oct 24
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Old questions (1 mark)

DECIPHER-I

BIOCHEMISTRY-II

23	Name types of immune responses	Jan 24
24	Function of IgA	Feb 23
25	Bence-Jones proteins	Aug 21
26	Immunoglobulin which serves as first line defence	Mar 21
27	Structure of immunoglobulin	Aug 15
28	Name two hormones causing increased levels of cAMP	Aug 12

BIOCHEMISTRY OF CANCER

SHORT ESSAYS

1	What are Oncogenes. Name four tumour markers with their clinical relevance	May 22
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SHORT ANSWERS

2	Name the tumor markers for (a) prostate carcinoma (b) Colon cancer (c) carcinoid syndrome (d) hepatoma	Jul 24
3	Biological effect of radiation on tissues	Jul 24
4	Explain the Biochemical basis of : "Folate antagonists are used as anti cancer drugs"	Jul 23, Feb 14
5	Tumour markers	Nov 23, Jan 20
6	Oncogenes	May 23
7	Role of oxidative stress in pathogenesis of cancer	Feb 23
8	Name two tumour markers with Clinical condition associated	Feb 22
9	Alpha fetoprotein	Sep 21
10	Clinical applications of tumor markers	Aug 21
11	Hormones as tumor markers	Mar 21
12	One mechanism of activation of proto-oncogenes to oncogenes	Mar 21
13	Name four tumour markers and its significance	Jan 20
14	Name any two tumour markers and conditions in which they are elevated	Aug 18
15	Cell cycle	Aug 16
16	Define tumour markers and mention four examples	

MCQs

Old questions (1 mark)

14	Name two tumor markers and their clinical applications	Jan 24, Nov 20, Feb 14, Aug 13
15	Name four oncogenes	May 23
17	Two enzymes as tumor markers and their clinical relevance	Feb 22
18	Name two tumour suppressor gene	Feb 22, Aug 12
19	Name two oncogenic viruses	Sep 21
20	Folic acid antagonists used in the treatment of cancer	Mar 21
21	Name two biochemical markers of cancer	Aug 15
22	Proto-oncogenes	Aug 15
23	Oncogenes	Feb 15
24	Mention any two features of p53 gene	Aug 14

EXTRACELLULAR MATRIX & TISSUE PROTEINS IN HEALTH & DISEASES

SHORT ESSAYS

1	Explain the salient features of structural organization of collagen. Mention the major disorders associated with collagen structure and function	Jan 24
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DECIPHER-I

SHORT ANSWERS

2	Structure and two functions of Collagen	Jul 24
3	Collagen	May 22, Feb 22
4	Elastin	Mar 21

CLINICAL LABORATORY PRACTICE: LABORATORY INSTRUMENTATION, TECHNIQUES AND QUALITY CONTROL

SHORT ESSAYS

1	Principles and applications of ELISA	Jan 24, Aug 21
2	Principle and applications of Beer-Lamberts law. Add a note on colorimetry	Feb 23
3	Principles and applications of electrophoresis	Mar 21

SHORT ANSWERS

4	Application of ELISA test	Jul 23
5	Micro arrays	May 23
6	What is the role of buffers in regulating blood pH	May 23
7	Chromatography	Feb 22
8	Radioimmunoassay	Aug 19
9	Principles of electrophoresis	Aug 18
10	Principles of ELISA and two clinical applications in clinical diagnosis	Feb 16
11	Principle of chromatography	Aug 15
12	Principle of colorimetry	Aug 15
13	Principles of radioimmunoassay	Feb 15
14	ELISA	Feb 14

MCQs

single response type questions

15	Serum electrolytes are estimated using a) Colorimetry b) Fluorimetry c) Ion selective electrode d) Spectrophotometry	Oct 24
16	Electrophoresis is used to separate the following biomolecules a) Serum proteins b) Lipoproteinb c) Hemoglobins d) All of the above	Oct 24

Assertion (A) and Reason (R)

17	Assertion(A): Analysis of plasma glucose in a plain tube can be done at any time after collecting sample, there won't be any change in plasma glucose level. Reason(R): Glycolysis will reduce the patient blood glucose level a) Both A and R are correct b) A incorrect R correct c) Both A and R are incorrect d) A correct R incorrect	Jul 24
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Old questions (1 mark)

18	Give the principle of RIA	Feb 22
19	Rf value	Aug 21
20	Enzymes commonly used in ELISA technique	Feb 13

APPLICATION OF ISOTOPES IN MEDICINE

SHORT ANSWERS

1	Applications of Radioactive Isotopes	Jan 24
2	Name four applications of radioactivity in diagnosis and management of	Jul 23

DECIPHER-I

	diseases.	
3	Applications of radioisotopes in medicine	Sep 21

GENERAL QUESTIONS

SHORT ANSWERS

	How is lifelong learning relevant to the professional growth of doctors	Oct 24
	Doctors should have a commitment for lifelong learning which is important for their professional growth – substantiate the statement.	Jul 24

MCQs

multiple response type questions

	From pairs of diseases and associated abnormalities, pick out the mismatched pair: 1) Maple syrup urine disease and metabolic acidosis 2) Conn's syndrome and Metabolic acidosis 3) SIADH (Syndrome of Inappropriate Antidiuretic Hormone) and hypertonic expansion 4) Waldenstrom's macroglobulinemia and hyperviscosity a) 2 & 4 b) 1, 2 & 3 c) 1 & 3 d) 2 & 3	Jul 24
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