

Dr. SOMERVEIL L MEMORIAL CSI MEDICAL COLLEGE & HOSPITAL
PHYSIOLOGY PAPER 1- 2025 MBBS BATCH

MODEL EXAMINATION

(GENERAL PHYSIOLOGY, BLOOD , CVS, RESPIRATORY, RENAL, GIT)

Date: 20.06.2026

Time: 9.30 am- 12.30pm

Total Marks : 100

I. MCQs – Questions attached separately (20 x 1mark = 20)

II. Essays : (2 x 10marks = 20)

1. A 35-year-old man was undergoing a major abdominal surgery. During the surgery, there was massive drop in BP, pulse was found to be rapid and thready with increase in respiratory rate.

1 a) What is the probable diagnosis (1)

**1 1/2 b) What immediate measures will the doctors do to bring back the
vitals to normal (1)**

**2 1/2 c) Explain the immediate Compensatory mechanisms, the body will undergo
physiologically in the above condition (4)**

2 d) Explain the Special features of Coronary circulation (4)

2. Explain the Neural and Chemical regulation of respiration. (6 +4)

P.T.O

III. Short Essays:

(5 x 6 marks = 30)

- 4 1. Explain the role of platelets in temporary hemostasis. Add a note on clot retraction
- u 2. Explain the different types of hypoxia with examples
- 7 3. Explain the mechanism of concentration of urine
- 7 4. Explain the mechanism of gastric ^{acid} secretion. Add a note on the Pathophysiology of Peptic ulcer
- \ 5. Explain the Cardio-respiratory changes during exercise

IV. Short Answer Questions:

(5 x 4 marks = 20)

- 3 1. Erythroblastosis fetalis
- 2 2. Draw and label normal ECG in lead II
- 7 3. Explain the mechanism of Na^+ reabsorption in renal tubules
- 2 4. Explain the second stage of deglutition
- 1 5. Lung Compliance

V. Physiological basis :

(5 x 2 marks = 10)

- 1 1. Heart act as a functional syncytium
- 0 2. HIV affects both Cellular and Humoral immunity
- 1 3. ~~Reabsorption~~ in Urinary bladder
- \ 4. Oral Rehydration Solution in dehydration
- W 5. Clay coloured stools in Obstructive jaundice

Dr. SOMERVELL MEMORIAL CSI MEDICAL COLLEGE & HOSPITAL
PHYSIOLOGY PAPER II - 2025 MBBS BATCH
MODEL EXAMINATION
(CNS, SPECIAL SENSES, NERVE MUSCLE, REPRODUCTION, ENDOCRINE, INTEGRATED
PHYSIOLOGY)

Date: 23.06.2026

Time: 9.30 am- 12.30pm

Total Marks : 100

I. MCQs – Questions attached separately (20 x 1mark = 20)

II. Essays : (2 x 10marks = 20)

1. A 65-year-old man with history of hypertension suddenly develops weakness of right arm and right leg. He also has difficulty in speaking. On examination, there was increased muscle tone, exaggerated deep tendon reflexes and a positive Babinski's sign on the right side.

- a) What is the probable diagnosis (1)
- b) Where is the site of lesion (1)
- c) Draw the pathway involved (3)
- d) Explain the physiological basis of the above signs and symptoms (4)
- e) As a doctor how will you counsel the patient and bystander (1)

2. Explain the actions of Glucocorticoids . Add a note on Cushing syndrome. (7 +3)

P.T.O

III. Short Essays:

(5 x 6 marks = 30)

1. Explain the events across Neuromuscular junction with diagram . Add a note on Myasthenia Gravis. (1+2)
2. Explain the connections and functions of Basal ganglia (3+3)
3. Pupillary Reflexes
4. Explain the ovarian & uterine changes during menstrual cycle.
5. Write the actions of Insulin . Differentiate between Diabetes Insipidus and Diabetes Mellitus.

IV. Short Answer Questions:

(5 x 4 marks = 20)

1. Excitation – Contraction coupling
2. Nerve action potential with ionic basis
3. Functions of Middle ear
4. Spermatogenesis & list the Functions of Sertoli cells
5. Second messenger

V. Physiological basis :

(5 x 2 marks = 10)

1. Cryptorchidism
2. Hypotonia in Cerebellar diseases
3. Phantom limb
4. Massaging the painful area reduces pain
5. Combined contraceptive pill

Dr. SOMERVELL MEMORIAL CSI MEDICAL COLLEGE, KARAKONAM
Department of Anatomy - I MBBS 2025 BATCH
Model Examination paper - 1

Upper Limb, Head & Neck, Neuroanatomy and General anatomy, General Histology, General Embryology, Genetics
Date: 16.06.2026
Time: 3 Hours
Total Marks: 100

- Answer all questions to the point neatly and legibly
- Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together.
- Draw diagrams wherever necessary

1. Multiple Choice Questions

(1x20=20)

Question numbers (i-v) are single response type questions.

- i) First dorsal interosseous muscle is supplied by
A. median nerve B. ulnar nerve
C. radial nerve D. axillary nerve
- ii) Nasolacrimal duct terminates into
A. superior meatus B. inferior meatus
C. bulla ethmoidalis D. hiatus semilunaris
- iii) Anterior belly of Digastric develops from the following pharyngeal arch
A. I B. II
C. III D. IV
- iv) Cranial nerve exit through the dorsal surface of the brainstem
A. abducent B. trigeminal
C. oculomotor D. trochlear
- v) Cells are arrested at which stage of cell division to obtain chromosomes of karyotyping
A. prophase B. anaphase
C. telophase D. metaphase

Question numbers (vi-x) are case-scenario based questions

A 22-year-old male develops fever, severe headache, and periorbital swelling 5 days after squeezing a pimple on his upper lip. He also complains of loss of sensation over the forehead and upper eyelid of the affected side. On examination, ptosis, medial squint, and dilated conjunctival veins are noted. Vision is also reduced.

vi) The most likely route of spread of infection from the upper lip to the cavernous sinus is via:

- A. facial artery
B. pterygoid venous plexus → inferior orbital vein → cavernous sinus
C. deep facial vein → pterygoid venous plexus → cavernous sinus
D. external jugular vein

vii) The squint is due to the involvement of which cranial nerve:

- A. optic nerve
B. trochlear nerve
C. abducent nerve
D. oculomotor nerve

viii) Name the branch of internal carotid artery that arises from this site

- A. middle meningeal artery
B. inferior hypophyseal artery
C. posterior communicating artery
D. anterior cerebral artery

ix) Above said sensory loss is due to involvement of which division of trigeminal nerve?

- A. maxillary division
- B. ophthalmic division
- C. mandibular division
- D. motor root of trigeminal

x) Which of the following structure is not present in the lateral wall of this sinus?

- A. oculomotor nerve
- B. trochlear nerve
- C. ophthalmic nerve
- D. abducent nerve

Question numbers (xi-xv) consists of two statements- Assertion (A) and Reason (R). Answer these questions by selecting the appropriate options given below.

- A. Both A and R are true. R is the reason for A
- B. Both A and R are true. R is not the reason for A
- C. A is correct but R is incorrect
- D. A is incorrect but R is correct

xi) Assertion: Injury to the surgical neck of the humerus may result in deltoid paralysis.
Reason: The axillary nerve is related to the spiral groove of the humerus.

xii) Assertion: A common site of bleeding from the nose is Little's area
Reason: Kiesselbach's plexus lies at the posteroinferior part of nasal septum

xiii) Assertion: Enlarged thyroid gland may cause hoarseness of voice.
Reason: Internal laryngeal nerve is closely related to the thyroid gland.

xiv) Assertion: Lesion of Broca's area of the dominant hemisphere leads to motor aphasia
Reason: Broca's area is located in the inferior frontal gyrus of the dominant hemisphere

xv) Assertion: In Tetralogy of Fallot there is VSD.
Reason: Pulmonary stenosis is a congenital defect in Fallot's Tetralogy.

Question numbers (xvi-xx) are multiple response type questions. Read the statements and mark the answers appropriately.

xvi) Median cubital vein is preferred for venepuncture because of following reasons.

- i) one of the tributaries of axillary vein
- ii) supported by the underlying bicipital aponeurosis
- iii) absences of valves
- iv) anchored to deep vein by perforating vein

- A) ii,iii
- B) ii,iv
- C) i,iii,iv
- D) i,ii,iv

xvii) Which of the following structures forming the tonsillar bed.

- i) pharyngobasilar fascia
- ii) buccinator muscle
- iii) buccopharyngeal fascia
- iv) middle constrictor of pharynx

- A) ii,iv
- B) i,ii,iii
- C) i,iii
- D) i,iii,iv

xviii) Which of the following statements are true regarding tympanic membrane?

- i) it develops from all three embryonic germ layers
- ii) its periphery thickened to form an elastic cartilagenous rim called annulus tympanicus
- iii) otoscopic view the cone of light is due to lateral process of malleus
- iv) it is medially related to chorda tympani nerve

- A) ii,iv
- B) i,iii
- C) i,ii,iii
- D) i,iv

xix) Which of the following structures are derived from the neural crest cells?

- i) adrenal medulla
- ii) neurons of dorsal root ganglion

Q

D) i, ii, iv

A

D)ii,iii,iv

$(2 \times 10 = 20)$

Long Essays:

2. A 42 year-old woman who works as a data entry operator, presents with a 3-month history of pain, tingling & numbness in her thumb, index, middle and radial half of the ring fingers of her right hand. On examination, there is reduced sensation over the lateral 3½ fingers & weakness of thumb opposition. Tinel's Sign over the wrist is positive. Based on your knowledge in anatomy answer the following questions.

$(\frac{1}{2} + \frac{1}{2} + 4 + 3 + 2 = 10)$
✓ ✓ 3 1½ 1
6½

$(\frac{1}{2} + \frac{1}{2} + \frac{4+3+2}{3} = 10)$
 $6\frac{1}{2}$

- c) The structures related to the nerve in the palm
- d) Course & distribution of the nerve in the palm
- e) Explain why the thenar eminence skin is spared but the thenar muscles are affected

(1+2+2+3)

$(1+2+2+3+2=10)$

19.

3. Describe internal capsule under the following headings

- d) Blood supply
- e) Clinical co-relation

(6x6=36)

4. Genetic counseling $4\frac{1}{2}$

5. Movement
6. Relations & arterial supply
7. Formation & derivatives of intra embryonic mesoderm
8. Microscopic anatomy of compound epithelium
9. Cubital fossa

(4x6=24)

12. Secreto-motor
13. Modifications of spinal plan
14. Compare & contrast the microscopic features
15. Draw a neat labeled diagram of transverse section of midbrain at the level $2\frac{1}{2}$ of superior colliculus

27

14

4

1

1

Dr. SOMERVELL MEMORIAL CSI MEDICAL COLLEGE, KARAKONAM
Department of Anatomy - I MBBS 2025 BATCH
Model Examination Paper II

Thorax, Abdomen & Pelvis, Lower limb with concerned Embryology & Histology
Date: 18.06.2026 **Time: 3 Hours** **Max. Marks: 100**

- Answer all questions to the point neatly and legibly
- Indicate the question number correctly for the answer in the margin space
- Answer all parts of a single question together.
- Draw diagrams wherever necessary

1. Multiple Choice Questions

(1x20=20)

Question numbers (i-v) are single response type questions.

- i) Left testicular vein usually drains into
- | | |
|----------------------|-----------------------|
| A. left renal vein | B. inferior vena cava |
| C. common iliac vein | D. portal vein |
- ii) Musculophrenic artery is a branch of
- | | |
|-------------------------------|--------------------------------|
| A. internal thoracic artery | B. superior intercostal artery |
| C. superior epigastric artery | D. inferior epigastric artery |
- iii) Fallopian tube is developed from the following duct
- | | |
|---------------------|----------------|
| A. para mesonephric | B. mesonephric |
| C. meta nephric | D. pronephric |
- iv) Podocytes are present in the lining of
- | | |
|--------------------|----------------------|
| A. PCT | B. DCT |
| C. renal corpuscle | D. collecting tubule |
- v) In benign hypertrophy the lobe of prostate involved is
- | | |
|--------------|------------|
| A. anterior | B. median |
| C. posterior | D. lateral |

Question numbers (vi-x) are case-scenario based questions

A 45-year-old female teacher presents with dilated, tortuous veins on the medial aspect of her right lower limb for 3 years. The swelling increases on prolonged standing and reduces on lying down. On examination, there are prominent subcutaneous veins extending from the medial malleolus up to the thigh. Trendelenburg test is positive.

- vi) At which level does the great saphenous vein drain into the femoral vein?
- | | |
|----------------------|---|
| A. adductor canal | B. saphenous opening of cribriform fascia |
| C. inguinal ligament | D. popliteal fossa |
- vii) Which of the following is the most important factor in preventing backflow of blood in lower limb veins in standing position?
- | | |
|--------------------------|------------------------|
| A. muscular pump of calf | B. perforator veins |
| C. valves in the veins | D. arterial pulsations |
- viii) In the above case, a positive Trendelenburg test indicates incompetence of valves in:
- | | |
|----------------------------|-------------------------|
| A. femoral vein | B. short saphenous vein |
| C. saphenofemoral junction | D. popliteal vein |

ix) The saphenous nerve that accompanies the great saphenous vein in the leg is a branch of:

A. common peroneal nerve
C. femoral nerve

B. tibial nerve
D. obturator nerve

- x) Which of the following is the correct sequence of venous drainage from foot to heart?
- A. dorsal venous arch → great saphenous → femoral → IVC
 - B. dorsal venous arch → small saphenous → popliteal → deep femoral → IVC
 - C. plantar venous arch → great saphenous → popliteal → IVC
 - D. dorsal venous arch → perforators → tibial → femoral → IVC

Question numbers (xi-xv) consists of two statements- Assertion (A) and Reason(R). Answer these questions by selecting the appropriate options given below.

- A. Both A and R are true. R is the reason for A
- B. Both A and R are true. R is not the reason for A
- C. A is correct but R is incorrect
- D. A is incorrect but R is correct

xi) Assertion: Fracture neck of femur may lead to avascular necrosis of the femoral head.
Reason: Retinacular vessels, the branches of medial femoral circumflex artery pass through the neck.

xii) Assertion: Trendelenburg gait occurs in superior gluteal nerve injury.
Reason: Gluteus maximus and medius stabilize the pelvis during walking.

xiii) Assertion: Cardiac pain is often referred to the left upper limb.
Reason: Heart and upper limb share spinal segments T3, T4 & T5.

xiv) Assertion: There is pain around umbilicus in early appendicitis.
Reason: Visceral afferent fibers from the appendix enter the spinal cord at T10.

xv) Assertion: The spleen enlarges towards the left iliac fossa
Reason: Movement is restricted inferiorly by the phrenicocolic ligament

Question numbers (xvi-xx) are multiple response type questions. Read the statements and mark the answers appropriately.

xvi) Which of the following are intracapsular structures of knee joint.

- i) menisci
- ii) cruciate ligaments
- iii) origin of popliteus
- iv) ligamentum patellae

A) i, ii B) ii, iii C) i, ii, iii D) i, iv

xvii) Mention the structures passing through the lesser sciatic foramen.

- i) internal pudendal vessels
- ii) tendon of obturator internus
- iii) nerve to obturator internus
- iv) inferior gluteal nerve

A) i, iii, iv B) iii, iv C) i, ii, iii D) ii, iv

xviii) Which of the following statements are true regarding typical intercostal nerve?

- i) second intercostal nerve give rise to intercosto brachial nerve
- ii) 3rd to 6th intercostal nerves are typical
- iii) all typical intercostal nerves have lateral cutaneous branch.
- iv) all typical intercostal nerves are dorsal ramii of thoracic spinal nerves.

A) i, ii, iii B) ii, iii, iv C) iii, iv D) ii, iii

xix) Which of the following are the contents of broad ligament of uterus?

- i) fallopian tube
- ii) ligament of ovary
- iii) ovarian artery
- iv) uterus

A) i, iv B) ii, iii C) i, ii, iii D) i, ii, iv

xx) Goblet cells are found in.

i) stomach

ii) intestine

iii) trachea

iv) bronchus

A) i, ii

B) iii, iv

C) i,iii

D) ii,iii,iv

Long Essays:

(2x10=20)

2. A 58-year-old man presents with progressive weight loss, early satiety and pain abdomen. On physical examination, a hard, non tender, enlarged left supraclavicular lymph node is palpated. Upper GI endoscopy & biopsy confirms adeno carcinoma of the stomach. Based on your knowledge in anatomy answer the following questions. (1+3 +2+2+2=10)

- Parts of stomach
- Peritoneal relations
- Lymphatic drainage
- Blood Supply
- Anatomical reason behind enlargement of lymph nodes mentioned above

3. Describe right lung under the following headings

(2 +2+3+3=10)

- Coverings
- Lobes & fissures
- Bronchopulmonary segments
- Developmental sources & congenital anomalies

Short Essays:

(6x 6=36)

- Supports of uterus
- Development of interatrial septum & anomalies
- Microscopic anatomy of kidney
- Structures under cover of gluteus maximus
- Porto-caval anastomoses
- Interior of anal canal

Write short notes on

(4x6=24)

- Cruciate ligaments of knee joint
 - Development of testis
 - Inversion & eversion of foot
 - Popliteus muscle
 - Coronary sinus
 - Draw a neat labelled diagram of transverse section of abdomen at the level of L1 vertebra
-

Dr SOMERVELL MEMORIAL CSI MEDICAL COLLEGE & HOSPITAL, KARAKONAM
DEPARTMENT OF BIOCHEMISTRY

I MBBS 2025-26 Batch

MODEL PAPER II

Time: 9.30-12.30 pm

Max Marks: 100

Date: 27.06.2026

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers. • Indicate the question number correctly for the answer in the margin space. • Answer all parts of a single question together • Leave sufficient space between answers • Draw table/diagrams/flow charts wherever necessary

(1x20=20marks)

1. MCQ

(2x10=20marks)

Long Essays

2. A 55-year-old man was brought to the hospital in a confused and semiconscious state. The patient displayed a typical hyperventilatory breathing pattern with a fruity odour in his breath. The pulse was feeble and the BP was low. Blood sugar was 450 mg%. Benedict's test and Rothera's test were positive in the urine sample. Blood gas parameters were as follows. How would you interpret this case and what is your probable diagnosis?

Blood pH: 7.2

Plasma HCO_3^- : 15 mEq/L

PaCO_2 : 40 mm of Hg

H_2CO_3 : 1.2 mEq/L

- Interpret the laboratory data & give probable diagnosis for the above disorder? (1.5)
- What is the defect & list 2 clinical conditions causing above acid base disorder? (2)
- Explain the renal compensatory mechanism. (4)
- Write a short note on anion gap. (2.5)

3. Describe the process of protein biosynthesis in eukaryotes. Add a note on post translational modification (7+3)

(6x6=36 marks)

Short Essays:

4. A 40 year old female with history of gall stones presented with acute abdominal pain, yellowish discoloration of sclera and passing clay-coloured stools.

- What is the probable diagnosis and suggest relevant biochemical tests to be done in the above case? (2)
- Differentiate between different types of jaundice using salient features and laboratory investigations. (4)

5. Classify renal function test and explain glomerular function test. (2+4)

6. Describe the types of mutation with suitable examples.

7. Explain the role of tumor markers in cancer screening & diagnosis with examples. (6X1=6)

8. Give reason:

- Photosensitivity in porphyria
- Electrophoretic pattern in cirrhosis, nephrotic syndrome, multiple myeloma.
- Hyperkalemia in metabolic acidosis and hypokalemia in metabolic alkalosis.

- d. BMR is decreased and cholesterol is increased in hypothyroidism.
- e. Feeding colostrum provides immunity to the child.
- f. Use of p53 protein in cancer.
- 9. Recombinant DNA technology and its applications in medicine.

Short answers

(6x4=24 marks)

- 10. Chain breaking and Preventive antioxidants.
- 11. Cytochrome P450 enzyme systems-Functions & properties
- 12. Structure of Collagen. Add a note on two related disorders
- 13. Doctors should have a commitment for lifelong learning which is important for their professional growth – substantiate the statement.
- 14. Mention any 4 preanalytical variables encountered in clinical laboratory.
- 15. Biochemical basis of:
 - a. Using ACE inhibitors for treatment of hypertension
 - b. Xeroderma pigmentosum

(20X1=20 MARKS)

1. Gene amplification can be achieved by:
- DNA finger printing
 - Southern blotting
 - Gene cloning
 - Polymerase chain reaction
2. Left handed double helix is present in
- Z-DNA
 - A-DNA
 - B-DNA
 - None of these
3. Which of the following instrument uses the property of absorption for measuring the analyte concentration?
- Flame photometer.
 - pH meter.
 - Colorimeter.
 - Luminometer.
4. Orotic aciduria is characterized by all the findings except:
- Deficiency of HGPRTase
 - Response to oral uridine
 - Failure to thrive
 - Megaloblastic anemia
5. Which is a reverse transcriptase?
- Topoisomerase
 - Telomerase
 - RNA polymerase I
 - DNA polymerase
6. Which of the following statements about Methotrexate are TRUE?
- Methotrexate inhibits dihydrofolate reductase (DHFR)
 - It interferes with purine and pyrimidine synthesis
 - Methotrexate is used as an anti-cancer and immunosuppressive drug
 - It enhances the conversion of dUMP to dTMP
- A. i, ii, iii B. i, iii, iv C. ii, iii, iv D. i, ii, iv
7. Which of the following statements about eukaryotic transcription are TRUE?
- The TATA box is located upstream of the transcription start site and helps position RNA Polymerase II
 - The 5' cap added to mRNA consists of 7-methylguanosine linked via a 3'-5' phosphodiester bond
 - Transcription termination in eukaryotes involves recognition of a polyadenylation signal

- iv. Enhancers and silencers can regulate transcription even when located thousands of base pairs away from the gene
- A. i, ii, iii B. i, iii, iv C. ii, iii, iv D. i, ii, iv
8. Which of the following statements about hemoglobinopathies are TRUE?
- Sickle cell anemia results from a single point mutation replacing glutamic acid with valine at position 6 of the β -globin chain
 - Hemoglobin C disease is caused by substitution of glutamic acid with lysine at the same position as in sickle cell disease
 - Thalassemias are caused by structurally abnormal globin chains
 - In β -thalassemia major, there is compensatory increase in fetal hemoglobin (HbF)
 - Hemoglobin S polymerizes under oxygenated conditions, leading to red cell sickling
- A. i, ii, v B. i, iii, iv C. i, iii, v D. i, ii, iv
9. Which of the following statements about Heme synthesis are TRUE?
- Cytoplasmic ALA synthase is the rate limiting enzyme.
 - Increased utilization of cytochrome P450 increases heme synthesis.
 - Lead inhibits ferrochelatase and ALA dehydratase.
 - Administration of glucose is used to relieve acute attacks porphyria
- A. i, ii, iii B. i, iii, iv C. ii, iii, iv D. i, ii, iv
10. Which of the following parameters are useful in assessing synthetic function of the liver?
- Serum albumin
 - Prothrombin time (INR)
 - Alkaline phosphatase
 - Total cholesterol
 - Serum ceruloplasmin
- A. i, ii, v B. i, iii, iv C. i, iii, v D. i, ii, iv
11. Assertion (A): PCR is a widely used technique to amplify specific segments of DNA. Reason (R): PCR requires RNA primers and DNA polymerase to initiate the amplification process.

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A

C. A is true, but R is false

D. A is false, but R is true

12. Assertion (A): In the presence of lactose and absence of glucose, the lac operon is maximally expressed.

Reason (R): Lactose inactivates the repressor, and high cAMP allows CAP to activate RNA polymerase at the promoter.

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A

C. A is true, but R is false

D. A is false, but R is true

13. Assertion (A): Total T4 levels may be elevated in pregnancy without signs of hyperthyroidism.

Reason (R): The pituitary fails to produce sufficient TSH to stimulate the thyroid gland.

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A

C. A is true, but R is false

D. A is false, but R is true

14. Assertion (A): Cyclin D/CDK4 phosphorylates Retinoblastoma (Rb) protein, promoting cell cycle progression

Reason (R): Loss of Rb function results in G1 arrest.

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A

C. A is true, but R is false

D. A is false, but R is true

15. Assertion (A): Apoptosis leads to inflammation due to release of intracellular contents.

Reason (R): Apoptotic cells undergo membrane rupture, spilling contents into the extracellular space.

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A

C. A is true, but R is false

D. A is false, but R is true

Case: A 50-year-old man presents with acute pain, redness, and swelling in his right big toe. He reports that the pain started suddenly at night. He has a history of hypertension and consumes alcohol regularly. Probable diagnosis of Gout was given.

16. What biochemical investigation you will do to confirm the diagnosis?

A. Serum Urea

B. Serum Uric acid

C. Serum Creatinine

D. Serum ALP

17. Allopurinol reduces uric acid levels primarily by:

A. Inhibiting adenine phosphoribosyltransferase

B. Enhancing renal excretion of uric acid

C. Inhibiting xanthine oxidase, reducing uric acid synthesis

D. Blocking PRPP synthetase

18. Enzyme involved in the purine salvage pathway is:

A. Adenine Phospho Ribosyl Transferase.

B. Phospho Ribosyl Amidotransferase.

C. Glycinamide Ribonucleotide Synthetase.

D. Phosphoribosyl Synthase.

19. Hyperuricemia in Lesch-Nyhan syndrome is due to deficiency of which enzyme?

A. Xanthine oxidase

B. Adenosine deaminase

C. PRPP synthetase

D. HGPRTase

20. Why are uric acid crystals more likely to precipitate in peripheral joints like the big toe?

A. Peripheral joints have higher purine turnover

B. Low temperature reduces uric acid solubility

C. Blood flow is highest in extremities

D. Synovial fluid contains excess xanthine oxidase

**Dr SOMERVELL MEMORIAL CSI MEDICAL COLLEGE & HOSPITAL,
KARAKONAM**

DEPARTMENT OF BIOCHEMISTRY

I MBBS 2025-26 Batch

MODEL PAPER I

Date: 26.06.2025

Time: 9.30-12.30 pm

Max Marks: 100

- Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers. • Indicate the question number correctly for the answer in the margin space. • Answer all parts of a single question together • Leave sufficient space between answers • Draw table/diagrams/flow charts wherever necessary

I MCQ

(1x20=20marks)

II Long Essays

(2x10=20marks)

2. 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.
 - a. What is the probable diagnosis? (0.5)
 - b. Discuss lab investigations done to diagnose Diabetes Mellitus with their normal levels. (4.5)
 - c. Describe the regulation of blood glucose in above case. (5)
3. Define and classify Enzymes. Mention the salient features of active site. Explain various ways by which enzyme activity is regulated in human body. Give suitable examples. (1+3+2+4) = 5

III Short Essays

(6x6=36 marks)

4. A 50 year old man was diagnosed of hemorrhoids and underwent operation in relation to it. He had several bleeding episodes in the past and was found to have microcytic hypochromic anemia.
 - a) Which mineral deficiency is associated with anemia in the above disease? (0.5)
 - b) Mention 2 good dietary sources of above nutrient. (1)
 - c) Explain the absorption, transport and storage of the above nutrient. (4.5)
5. Describe the different types of enzyme inhibition with appropriate examples. 3
6. Define chemiosmotic theory? Draw the structure of ATP synthase complex and explain how ATP is synthesised? Add a note on inhibitors. (1+3+2) 2
7. Describe synthesis, transport and disposal of ammonia.
8. Biochemical basis of: (6X1=6)
 - a) Use of warfarin and dicumarol as anticoagulant.
 - b) Using curd for treatment of lactose intolerance.
 - c) Membrane fluidity.
 - d) Jaundice and cataract in classical galactosemia.
 - e) Supplementing pyridoxine to a Tuberculosis patient on Isoniazid.
 - f) Supplementing essential fatty acids in diet.
9. Describe the fate of exogenous and endogenous lipids diagrammatically.

(6x4=24 marks)

IV Short answers

10. Explain the metabolic adaptations in well fed state
11. Write four differences between Kwashiorkor and Marasmus.
12. Role of vitamin A in vision
13. Anaplerotic role of citric acid cycle.
14. Phenylketonuria.
15. Give reason:
 - a. Premature infants have higher incidence of Respiratory Distress Syndrome.
 - b. Muscle glycogen does not contribute to blood glucose level- Justify. Mention two glycogen storage disorders.

MCQ

(20X1=20 MARKS)

Maple Syrup Urine Disease (MSUD) is due to defect in _____ of branched chain amino acid

- A. Acetylation.
- B. Decarboxylation.
- C. Methylation.
- D. Hydroxylation.

2. Tay-Sachs disease results from inherited deficiency of:

- A. Arylsulphatase A
- B. Hexosaminidase A
- C. Sphingomyelinase
- D. Ceramidase

3. A dietary deficiency of tryptophan and nicotinate leads to

- A. Beri Beri
- B. Xerophthalmia
- C. Anemia
- D. Pellagra

4. Keshan's disease is due to deficiency of:

- A. Chromium.
- B. Selenium.
- C. Magnesium.
- D. Copper.

5. Methionine is deficient in:

- A. Cereals
- B. Pulses
- C. Maize & corn
- D. Tapioca

6. Following are the products derived from cholesterol:

- i. Bilirubin
- ii. Bile Salt
- iii. Vitamin D
- iv. Steroid hormone

A. i, ii, iii B. i, ii, iv C. ii, iii, iv D. i, iii, iv

7. Following are true about ketone bodies:

- i. Ketone body is synthesised in liver mitochondria
- ii. Ketone bodies provide alternate fuel for liver.
- iii. Normal level of ketone body is <1 mg/dL.
- iv. A high insulin level favors ketogenesis.

A. i, iii B. i, iv C. iii, iv D. ii, iv

8. Following statements are true:

- i. Insulin requires disulphide bonds for structural stability.
- ii. Alpha helix in a protein contains 3.6 amino acid residues.
- iii. In secondary structure of protein amino acids are 1.5 Å apart.
- iv. Denaturation of proteins does not affect the primary structure.

A. i, ii, iii B. i, ii, iv C. ii, iii, iv D. i, iii, iv

9. Which of the following enzymes are considered key regulatory enzymes of glycolysis?

- i. Hexokinase
- ii. Phosphofructokinase-1 (PFK-1)
- iii. Pyruvate kinase
- iv. Lactate dehydrogenase

A. i, ii, iii B. i, ii, iv C. ii, iii, iv D. i, iii, iv

10. Which of the following statements about isoenzymes are TRUE?

- i. Isoenzymes catalyze the same reaction but differ in structure
- ii. Lactate dehydrogenase (LDH) has five isoenzyme forms
- iii. Creatine kinase-MB (CK-MB) is specific for liver disease
- iv. Isoenzymes can be separated by electrophoresis

A. i, ii, iii B. i, iii, iv C. i, ii, iv D. ii, iii, iv

11. Which of the following are considered lipotropic factors that help prevent fatty liver?

- i. Carnitine
- ii. Choline
- iii. Methionine
- iv. Biotin
- v. Inositol

A. i, ii, iii B. ii, iii, iv C. i, ii, v D. ii, iii, v

12. Assertion (A): B12 deficiency leads to folate deficiency.

Reason (R): Both the vitamins are necessary for the metabolism of cysteine

- A. Both A and R are true, and R is the correct explanation of A
- B. Both A and R are true, but R is not the correct explanation of A
- C. A is true, but R is false
- D. A is false, but R is true

13. Assertion (A): GABA is an inhibitory neurotransmitter.

Reason (R): Formation and metabolism of GABA require PLP

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A

C. A is true, but R is false

D. A is false, but R is true

14. Assertion (A): G-6-PD deficiency causes hemolysis.

Reason (R): HMP shunt is the only source of NADPH in RBC.

A. Both A and R are correct and R is the reason for A

B. A Correct R incorrect

C. A incorrect R Correct

D. Both A and R incorrect

15. Assertion (A): Prostaglandins are implicated in the uterine cramping and pain experienced during dysmenorrhea.

Reason (R): Excess prostaglandin E_2 (PGE_2) stimulates uterine smooth muscle relaxation

A. Both A and R are true, and R is the correct explanation of A

B. Both A and R are true, but R is not the correct explanation of A

C. A is true, but R is false

D. A is false, but R is true

Case: A 10 year old boy presents with progressive visual impairment. On examination, he has downward displacement of the lens, tall stature, long slender fingers and mild intellectual disability. Laboratory investigations reveal elevated plasma homocysteine levels and methionine levels.

16. What is the probable diagnosis?

A. cystinosis

B. Hypermethioninemia

C. Cystathioninuria

D. Homocystinuria

17. Which enzyme deficiency is the most likely cause?

A. Phenylalanine hydroxylase

B. Cystathionine β -synthase

C. Homogentisate oxidase

D. Branched-chain α -ketoacid dehydrogenase

18. The deficient enzyme requires which vitamin?

A. B1

B. B6

C. B9

D. B12

19. Other lab investigation to confirm the above disorder include

A. Ferric chloride test

B. Cystathionine level

C. Cyanide Nitroprusside test

D. Obermeyer's Test

20. Which of the following is not a complication of the above disorder?

A. Osteoporosis

B. Ectopia Lentis

C. Thromboembolism

D. Megaloblastic anemia