

Perform a test to demonstrate the presence of uric acid in the sample provided in the bottle.

- 1. Write the Beer-Lambert's law. (2)**
- 2. What is the reference level for serum protein and albumin? (2)**
- 3. Normal A:G ratio. (2)**
- 4. 2 conditions where A:G ratio is reversed. (2)**

A 34 male presented with nausea and decreased appetite. On examination he had yellowish discoloration of sclera and mucous membrane. His urine was dark yellow in colour.

Perform the relevant tests with the urine sample to diagnose the condition.

1. Classify jaundice and write two causes of each type.
2. Name the enzymes elevated in hepatocellular and obstructive jaundice.

A 40 male presented with nausea weight loss and decreased appetite. On examination he had yellowish discoloration of sclera and mucous membrane. CT scan revealed tumour in the head of pancreas.

Perform the relevant tests with the urine sample to diagnose the condition.

1. What type of jaundice do you expect in this case?
2. Which type of bilirubin will be elevated in this case? Which enzyme is the marker enzyme of this condition?

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Perform the relevant tests with the urine sample to diagnose the condition.

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Perform the relevant tests with the urine sample to diagnose the condition.

1. What type of jaundice do you expect in this case?
2. Which type of bilirubin will be elevated in this case? Which enzyme is the marker enzyme of this condition?

A 50 years old obese female presented with loss of appetite and nausea. She had yellowish sclera and itching all over her body. Her urine was dark yellow in colour.

Perform the relevant tests with the urine sample to diagnose her condition.

1. What is the source of bile pigment in our body? Where is it synthesised?
2. What is urobilinogen? How do you detect it in urine?

A 52 years old obese female presented with yellowish sclera and itching all over her body. Her urine was dark yellow in colour.

Perform the relevant tests with the urine sample to diagnose her condition.

1. Name the bile salts. What is their function?
2. What is the precursor of bile acids in our body?

A 34 male presented with nausea and decreased appetite. On examination he had yellowish discoloration of sclera and mucous membrane. His urine was dark yellow in colour.

Perform the relevant tests with the urine sample to diagnose the condition.

1. What is your most probable diagnosis?
2. What kind of Van den Bergh reaction will be there in his serum sample?

A 34 male presented with nausea and decreased appetite. On examination he had yellowish discoloration of sclera and mucous membrane. His urine was dark yellow in colour.

Perform the relevant tests with the urine sample to diagnose the condition.

1. Name the bile salts? Mention the main enzyme involved in synthesis of bile acids.
2. Why is the colour of urine dark yellow? What do you expect about the colour of stool?

A 70 years old male patient was refusing to eat food for past few days. He became unconscious and had rapid breathing with fruity odour in his breath. His blood and urine samples were sent for diagnosis.

Perform the relevant tests in the urine sample provided.

1. What is your most probable diagnosis?
2. Write the reactions of ketogenesis and ketolysis.

A 35 years old factory worker on hunger strike presented in semiconscious state. He had rapid breathing with fruity odour in his breath. His blood and urine samples were sent for diagnosis.

Perform the relevant tests in the urine sample provided.

1. Why ketosis happens in such condition?
2. Name the ketone bodies. Name the hormone that activate ketogenesis pathway.

A 70 years old male patient was refusing to eat food for past few days. He became unconscious and had rapid breathing with fruity odour in his breath. His blood and urine samples were sent for diagnosis.

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Perform the relevant tests in the urine sample provided.

1. What is your most probable diagnosis?
2. Name the ketone bodies. Name the hormone that activate ketogenesis pathway.
3. Why ketone bodies cannot be used by liver?

A 35 years old factory worker on hunger strike presented in semiconscious state. He had rapid breathing with fruity odour in his breath. His blood and urine samples were sent for diagnosis.

Perform the relevant tests in the urine sample provided.

1. Why ketosis happens in such condition?
2. Name the ketone bodies. Name the hormone that activate ketogenesis pathway.

A female patient presented at 20th week of gestation. She has history of gestational diabetes mellitus in her previous pregnancy. During OGTT her blood and urine samples are collected.

Perform the relevant test in her urine sample collected at 2 hours and comment.

1. What is gestational diabetes mellitus?
2. Mention two complications of gestational diabetes mellitus.

A 45 years old female presents with weight loss, excessive thirst, and frequent urination. She was advised to undergo complete laboratory investigations to diagnose diabetes mellitus.

Perform the relevant test in her urine sample to demonstrate the presence of reducing sugar.

1. Name the specific test to detect glucose in urine sample?
2. Which glucose transporter is present in renal tubules? What will happen of this transporter is defective?

A female patient in 24th week of gestation comes to OP. She has history of gestational diabetes mellitus in her previous pregnancy. During OGTT her blood and urine samples are collected.

Perform the relevant test in her urine sample collected at 2 hours and comment.

1. What is gestational diabetes mellitus?
2. What is OGTT? Mention two indications of OGTT.

A 55 years old male presented with polyuria, polydipsia, and polyphagia. His urine sample has been provided.

Do the relevant test to show the presence of reducing sugar in the urine sample.

1. What is your most probable diagnosis? What are the diagnostic criteria for that condition?
2. Give 4 examples of non-carbohydrate reducing substances in urine sample.

A 55 years old male presented with polyuria, polydipsia, and polyphagia. His urine sample has been provided.

Do the relevant test to show the presence of reducing sugar in the urine sample.

1. What is the difference between glycosuria and glucosuria? Enumerate 3 causes of glycosuria.
2. What is renal threshold of blood glucose?

A 10 years old boy was brought to OP with generalised swelling all the body. His urine had milky appearance. The urine sample was sent for biochemical analysis.

Perform the relevant test to demonstrate the presence of protein in his urine sample.

1. What is Bence Jones protein?
2. How do you detect Bence Jones protein in urine?

An 8 years old boy was brought to OP with generalised swelling all the body. His urine had milky appearance. The urine sample was sent for biochemical analysis.

Perform the relevant test to demonstrate the presence of protein in his urine sample.

1. What is nephrotic syndrome?
2. Why there is hyperlipidemia in nephrotic syndrome?

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Perform the relevant test to demonstrate the presence of protein in his urine sample.

1. What is microalbuminuria? What is its significance?
2. What are the bands in normal serum protein electrophoresis?
Name 1 protein in each band.

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Perform the relevant test to demonstrate the presence of protein in his urine sample.

1. What is your most probable diagnosis?
2. Which protein is found in urine first and why?

A 10 years old boy was brought to OP with generalised swelling all the body. His urine had milky appearance. The urine sample was sent for biochemical analysis.

Perform the relevant test to demonstrate the presence of protein in his urine sample.

1. What is denaturation? Why peptide bond does not break in denaturation?
2. Name some denaturing agents.

A 10 years old boy was brought to OP with generalised swelling all the body. His urine had milky appearance. The urine sample was sent for biochemical analysis.

Perform the relevant test to demonstrate the presence of protein in his urine sample.

1. What is the normal specific gravity of urine. Name 1 condition where it is low and fixed.
2. Why albumin does not appear in urine even though it has small size?

A 10 years old boy was brought to OP with generalised swelling all the body. His urine had milky appearance. The urine sample was sent for biochemical analysis.

Perform the relevant test to demonstrate the presence of protein in his urine sample.

1. What is Bence Jones protein?
2. How do you detect Bence Jones protein in urine?

A 40 years old male with history of diabetes mellitus presented in semiconscious state. He had rapid breathing with fruity odour in his breath. His blood and urine samples were sent for diagnosis.

Perform the relevant tests in the urine sample provided.

1. What is your most probable diagnosis?
2. What is anion gap and its normal value? What type of acid base disorder happens in ketosis?

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A 35 years old male with history of diabetes mellitus presented in semiconscious state. He had rapid breathing and the breath had fruity odour. His blood and urine samples were sent for diagnosis.

Perform the relevant tests in the urine sample provided.

1. Name the ketone bodies. Which one does not give this test positive?
2. Where are they synthesised and utilised? Why liver cannot utilize them?

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Perform the relevant tests in the urine sample provided.

3. Name the ketone bodies. Which one does not give this test positive?
4. Where are they synthesised and utilised? Why liver cannot utilize them?

A 30 years old female with history of diabetes mellitus, on irregular treatment, presented in semiconscious state. She had rapid breathing with fruity odour in her breath. Her blood and urine samples were sent for diagnosis.

Perform the relevant tests in the urine sample provided.

1. What is your most probable diagnosis?
2. What is the normal p H of blood? What will happen to blood p H in this condition?

A 35 years old male with history of diabetes mellitus presented in semiconscious state. He had rapid breathing and the breath had fruity odour. His blood and urine samples were sent for diagnosis.

Perform the relevant tests in the urine sample provided.

1. Name the ketone bodies. Which one does not give this test positive?
2. Where are they synthesised and utilised? Why liver cannot utilize them?

A 35 years old male with history of diabetes mellitus presented in semiconscious state. He had rapid breathing with fruity odour in his breath. His blood and urine samples were sent for diagnosis.

Perform the relevant tests in the urine sample provided.

1. What is your most probable diagnosis?
2. Name the ketone bodies. What type of acid base disorder happens in ketosis?

A 50 year old male patient presented with a non-healing wound in right toe. On examination he had diminished sensation in hands and feet. Physician asked him to check his blood sugar and HbA1C.

Estimate the blood sugar in the given sample (Protein Free Filtrate is provided) and report.

1. What is HbA1C and what is its significance?
2. Why the sample for blood sugar estimation collected in fluoride tubes?

A 45 years old male patient complains of polyuria, polyphagia and excessive thirst. The physician advised him to get his blood sugar checked.

Estimate the blood sugar in the sample (protein free filtrate has been provided) and report.

1. Name the hormones that increase blood glucose levels?
2. What is hypoglycemia? Mention two clinical features of hypoglycemia.

A 16 years old female was brought unconscious to casualty. She had rapid breathing with smell of acetone in breath. Her blood sample is collected for sugar estimation.

Estimate the blood sugar in the given sample (Protein Free Filtrate provided) and report.

1. What is diabetes mellitus? What are the diagnostic criteria for diabetes mellitus?
2. What is metabolic acidosis? Mention two causes of metabolic acidosis?

A 53 years old male presented with dimness of vision and numbness in extremities. His HbA1C was 9%. His blood sample was taken for estimation of sugar.

Estimate blood sugar in given sample (Protein Free Filtrate provided) and report.

1. What are the criteria for diagnosis of diabetes mellitus?
2. Write two acute and two chronic complications of diabetes mellitus.

A 50 year old male patient presented with a non-healing wound in right toe. On examination he had diminished sensation in hands and feet. Physician asked him to check his blood sugar and HbA1c.

Estimate the blood sugar in the given sample (Protein Free Filtrate is provided) and report.

1. What is HbA1c and what is its significance?
2. Why the sample for blood sugar estimation collected in fluoride tubes?

A 45 years old male patient complains of polyuria, polyphagia and excessive thirst. The physician advised him to get his blood sugar checked.

Estimate the blood sugar in the sample provided and report. (Protein Free Filtrate has been provided)

1. What is the normal value of fasting and post prandial blood sugar?
2. Mention 2 acute complications of diabetes mellitus.
3. What is HbA1c and its significance?

A 45 years old male patient complains of polyuria, polyphagia and excessive thirst. The physician advised him to get his blood sugar checked.

Estimate the blood sugar in the sample provided and report. (Protein Free Filtrate has been provided)

1. What is the normal value of fasting and post prandial blood sugar?
2. Mention 2 acute complications of diabetes mellitus.
3. What is HbA1c and its significance?

A 24-year-old known diabetic male was brought to casualty in comatose condition. He had rapid breathing and there was smell of acetone in breath.

His blood sample has been provided. Estimate the blood sugar in the given sample (Protein Free Filtrate is provided).

1. What is your probable diagnosis?
2. What kind of acid base disorder do you find in this case?
3. What is anion gap?

A 67-year-old female with long standing history of diabetes mellitus has severe pallor and decreased urine output. Before undergoing dialysis her blood samples are sent for investigations.

Estimate serum creatinine in the sample and report. (Protein Free Filtrate is provided)

1. What is the source of creatinine in our body?
2. What is clearance? How is it calculated?

A 40 years old obese male presented with dimness of vision. On examination he had premature cataract. He also complains of excessive thirst and frequent urination. His blood sample is provided.

Estimate blood sugar in the given sample (Protein Free Filtrate is provided) and report.

1. Write the diagnostic criteria for diabetes mellitus.
2. Mention the pathway of cataract formation in diabetes mellitus.

A 45 years old male patient complains of polyuria, polyphagia and excessive thirst. The physician advised him to get his blood sugar checked.

Estimate the blood sugar in the sample (protein free filtrate has been provided) and report.

1. Name any 4 hormones that increase blood glucose levels?
2. What is hypoglycemia? Mention two clinical features of hypoglycemia.

A 56-year-old male with long standing history of diabetes mellitus has presented with features of chronic kidney disease.

Estimate serum creatinine in his sample. (Protein Free Filtrate is provided)

1. What is the difference between creatine and creatinine?
2. What is creatinine clearance? What is its significance?

A 5 year old boy presented with proteinuria and generalised swelling all over the body.

Estimate total protein in the given serum sample and report.

1. What is your most probable diagnosis?
2. What is the cause of edema in this child?

A 4 year old boy presented with proteinuria and generalised swelling all over the body.

Estimate serum albumin in the given sample and report.

1. What is the cause of edema in this patient?
2. How do you detect protein in urine sample?

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1. What is the difference between creatine and creatinine?
2. What is creatinine clearance? What is its significance?

A 5-year-old boy presented with proteinuria and generalised swelling all over the body.

Estimate total protein in the given serum sample and report.

1. Mention 3 causes of hypoproteinemia.
2. What is the cause of edema in this child?

A 65-year-old male presents with difficulty in passing urine. He frequently gets up at night to pass urine but takes a lot of time during micturition. The USG scan showed enlarged prostate.

Estimate the serum creatinine level in the given sample. (Protein Free Filtrate is provided)

1. Mention the parameters estimated to assess kidney function and write their normal values.
2. Define creatinine clearance. Write its normal value.

A college student had nausea and loss of appetite. His blood sample was taken for liver function tests.

Estimate serum albumin in the given sample and report.

1. Mention two functions of albumin.
2. Why is serum albumin estimation a part of liver function tests?

A 56-year-old male with long standing history of diabetes mellitus has presented with features of chronic kidney disease.

Estimate serum creatinine in his sample. (Protein Free Filtrate is provided)

1. What is the difference between creatine and creatinine?
2. Name the amino acids involved in creatine synthesis.
3. What is creatinine clearance? What is the significance?

A 67-year-old female with long standing history of diabetes mellitus has severe pallor and decreased urine output. Before undergoing dialysis her blood samples are sent for investigations.

Estimate serum creatinine in the sample and report. (Protein Free Filtrate is provided)

1. What is the source of creatinine in our body?
2. What is creatinine clearance? How it is calculated?

A 67-year-old female with long standing history of diabetes mellitus has severe pallor and decreased urine output. Before undergoing dialysis her blood samples are sent for investigations.

Estimate serum creatinine in the sample and report. (Protein Free Filtrate is provided)

1. What is the source of creatinine in our body?
2. What is cystatin C and why it is better than creatinine clearance?

A 56 years old chronic hypertensive patient presents with low urine output and generalised edema. The nephrologist wanted to start dialysis and hence sent the blood sample for renal function test.

Estimate blood urea in the given sample (Protein Free Filtrate is provided)

1. Name the blood tests useful to assess the kidney function.
2. What is clearance and how do you calculate it?

A 59 years old chronic diabetic patient presents with low urine output and generalised edema. The nephrologist wanted to start dialysis and hence sent the blood sample for renal function test.

Estimate blood urea in the given sample (Protein Free Filtrate is provided)

1. Why is estimation of urea a part of renal function test?
2. What is clearance? Why is creatinine clearance better than urea clearance?

A 56 years old chronic hypertensive patient presents with low urine output and generalised edema. The nephrologist wanted to start dialysis and hence sent the blood sample for renal function test.

Estimate blood urea in the given sample (Protein Free Filtrate is provided)

1. Mention three causes for increase in blood urea levels.
2. Where is urea synthesised? What are the sources of nitrogen in urea molecule?

A 60-year-old chronic diabetic patient presents with decreased urine output and swelling all over the body. He was advised dialysis.

Estimate blood urea in the given sample (Protein Free Filtrate has been provided) and comment.

1. What is the source of urea in our body? Where is urea synthesised?
2. Mention 3 causes of increased blood urea.

A 56 years old chronic hypertensive patient presents with low urine output and generalised edema. The nephrologist wanted to start dialysis and hence sent the blood sample for renal function test.

Estimate blood urea in the given sample (Protein Free Filtrate is provided)

1. Name the blood tests useful to assess the kidney function.
2. What is clearance and how do you calculate it?

A 67 years old chronic diabetic patient presents with low urine output and generalised edema. The nephrologist wanted to start dialysis and hence sent the blood sample for renal function test.

Estimate blood urea in the given sample (Protein Free Filtrate is provided)

1. Why is creatinine estimation better than urea estimation in assessing the functions of kidney?
2. What is clearance and how do you calculate it?

A 5 years old boy was admitted in paediatric ward with severe diarrhoea, vomiting and reduced urine output. A blood sample was sent for renal function tests.

Estimate blood urea in the given sample (Protein Free Filtrate is provided)

1. Where is urea synthesised in our body? Which is the most important regulatory molecule for urea cycle?
2. What is clearance test and what is its significance?

A 60-year-old chronic diabetic patient presents with decreased urine output and swelling all over the body. He was advised dialysis.

Estimate blood urea in the given sample (Protein Free Filtrate has been provided) and comment.

1. What is the source of urea in our body? Where is urea synthesised?
2. Mention 3 causes of increased blood urea.

A 20 years old college student had nausea and loss of appetite for last 10 days. His blood sample was taken for liver function tests.

Estimate serum albumin in the given sample and report.

1. Where is albumin synthesised in our body?
2. Mention 3 causes of hypoalbuminemia?

A college student had nausea and loss of appetite. His blood sample was taken for liver function tests.

Estimate serum albumin in the given sample and report.

1. Mention two functions of albumin.
2. Why is serum albumin estimation a part of liver function tests?

A 20 years old college student presented with nausea and loss of appetite for last 10 days. His blood sample was taken for liver function tests.

Estimate serum albumin in the given sample and report.

1. What is the normal A:G ratio. Mention two conditions where it is reversed.
2. Why is serum albumin estimation a part of liver function tests?

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Estimate serum albumin in the given sample and report.

1. Where is albumin synthesised in our body?
2. Mention 3 causes of hypoalbuminemia?

A 40 year old male presented with ascites and edema. He is addicted to alcohol for past 15 years. USG scan showed fibrosed and shrunken liver suggestive of cirrhosis.

Estimate the albumin in given serum sample and comment.

1. Explain the biochemical basis of edema in such patients.
2. What is the normal A: G ratio? What will be the A: G ratio in this patient?

A 2 years old female child was brought to OPD. She had generalised edema and was diagnosed as protein energy malnutrition.

Estimate total protein in the given serum sample and report.

1. What is protein energy malnutrition? Which type of PEM this patient has?
2. Mention 4 functions of plasma proteins

A 6 years old female child was brought to OPD. She was irritable and had low body weight.

Estimate total protein in the given serum sample and report.

1. Name the plasma proteins. Mention 4 functions of plasma proteins.
2. What is the normal A: G ratio?

A 54-year-old male presented with ascites and edema. History is suggestive of alcoholism for last 20 years. USG scan showed fibrosed and shrunken liver suggestive of cirrhosis.

Estimate the albumin in given serum sample and comment.

1. Explain the biochemical basis of edema in such patients.
2. What is the normal A: G ratio? What will be the A: G ratio in this patient?

A 50-year-old alcoholic patient presented with ascites and edema all over the body. The USG scan of abdomen showed cirrhosis of liver.

Estimate total protein in the given serum sample and report.

1. What is the normal A: G ratio and mention two conditions where it is reversed?
2. Name two positive and 2 negative acute phase proteins.

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A 4 year old boy presented with proteinuria and generalised swelling all over the body.

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1. What is the cause of edema in this patient?
2. How do you detect protein in urine sample?

A 5 year old boy presented with proteinuria and generalised swelling all over the body.

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1. What is nephrotic syndrome?
2. What is the cause of edema in this child?

A 6 years old female child was brought to OPD. She was irritable and had low body weight.

Estimate total protein in the given serum sample and report.

1. Name the plasma proteins. Mention 4 functions of plasma proteins.
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2. How do you detect protein in urine sample?

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Estimate total protein in the given serum sample and report.

1. What is nephrotic syndrome?
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A 6 years old female child was brought to OPD. She was irritable and had low body weight.

Estimate total protein in the given serum sample and report.

1. Name the plasma proteins. Mention 4 functions of plasma proteins.
2. What is the normal A: G ratio?

Demonstrate one inorganic constituent in the normal urine sample provided

Demonstrate two organic constituents in the normal urine sample provided

Demonstrate one organic constituent in the normal urine sample provided

Demonstrate one organic and one inorganic constituent in the normal urine