SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION & RESEARCH

(A DEEMED TO BE UNIVERSITY)

B.Sc. Allied Health Sciences Second Year (Semester-III)
April 2023 Examination

B.Sc. Medical Laboratory Technology (MLT)

Time : 2.30 Hrs. **[Max. Marks : 80]**

SUBJECT : BIOCHEMISTRY - I

Q.P Code : J3031

Your answers should be specific to the questions asked.
Draw neat labeled diagrams wherever necessary.

Long Essay **2X10=20 Marks**

1. Define polysaccharides? Classify them and give examples with their composition and biomedical importance. **(**1+4+5**)**
2. Define Enzymes. Classify enzymes. Give two examples for each class and the reaction catalyzed by them (1+5+4)

Short Essay(Answer Any Six) **6X5=30 Marks**

3 Define & write the differences between Active & Passive transport
4 Name five biologically important nucleotides with biological function.
5 Describe the Structure of DNA with neat labeled diagram 1+2+2
6 Define Proteins. Classify proteins with example. 1+4
7 Define lipoproteins. Classify lipoproteins with their functions 1+4
8 Describe the role of Vitamin A in Vision
9 What are dietary fibers? Give examples. Describe the beneficiary effect & disadvantage of dietary fibers. (1+1+2+1)
10 Describe the Folate trap.

Short Answers(Answer Any Ten) **10X3=30 Marks**

11 What is active site of an enzyme? List 2 features of active site.
12 Define essential amino acids and Name them
13 Define Symport & Antiport
14 What is secondary structure of Proteins? Give examples.
15 What is Denaturation? List two factors causing Denaturation.
16 What is Nitrogen balance? Mention two conditions with positive Nitrogen balance
17 Deficiency manifestation of (1)Thiamine (2)Niacin (3)Vitamin C
18 Define Homopolysachrides. Give examples.
19 Mention two Diagnostic enzymes with their applications
20 What is Protein Energy Malnutrition (PEM)? Classify PEM.
21 Define Balanced Diet.
22 Write the functions of the following: Mitochondria, Lysosomes, plasma membrane

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SUBJECT : BIOCHEMISTRY - II

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Long Essay **2X10=20 Marks**

1. Describe the steps of Citric Acid cycle, and add a note on its energetic. (8+2)
2. Describe the dietary source, RDA, Biochemical functions & deficiency manifestations of Calcium (2+2+4+2)

Short Essay(Answer Any Six) **6X5=30 Marks**

3. Glucose tolerance test (GTT): Indications, contraindications, Procedure for GTT (1+1+3)
4. With a neat labelled diagram, explain the Chemiosmotic theory.
5. Describe the digestion & absorption of lipids.
6. Define Urea & write the steps of urea cycle. (1+4)
7. What is Atherosclerosis? Explain pathogenesis and factors contributing to Atherosclerosis. (1+2+2)
8. Explain the, sources & biochemical functions of Copper & zinc (2.5+2.5)
9. What is porphyria? Classify them and explain acute intermittent porphyria. (1+2+2)
10. Define Gluconeogenesis. Name the substrates for Gluconeogenesis. Write briefly the steps for Gluconeogenesis. (1+1+3)

Short Answers(Answer Any Ten) **10X3=30 Marks**

11 Define Fatty Liver. Mention the causes of fatty liver
12 Write three biomedical importance of HMP shunt
13 Write any three functions of iodine.
14 What is the normal serum cholesterol level? List the conditions which will cause hypercholesterolemia.
15 Homocystinuria : enzyme defect & biochemical parameters
16 Write the reference range for: (1) serum urea (2) serum uric acid (3) serum creatinine.
17 Mention any three uncouplers of oxidative phosphorylation.
18 Mention the enzyme deficient in Lesch Nyhan syndrome and write two clinical features
19 Detoxification by conjugation with one example.
20 Write three glycogen storage disorders with enzyme defect
21 What are ketone bodies? Mention 2 causes for Ketoacidosis.
22 Mention two copper containing enzymes

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SUBJECT : BIOCHEMISTRY - III

Q.P Code : J3033

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Long Essay (Answer All Questions): **2X10=20 Marks**

1. Define pH. Write the normal pH of blood & explain the renal mechanisms involved in regulation of Blood pH. (2+2+6)
2. Give an account on Principle, different types, instrumentation, procedure and applications of Electrophoresis. (2+8)

Short Essay(Answer Any Six) **6X5=30 Marks**

3. Describe the various steps of phlebotomy
4. Classify renal function test & add a note on assessment of glomerular filtrate (4+1)
5. Define sensitivity & specificity & give an example (2.5+2.5)
6. Describe the importance of automation in clinical biochemistry laboratory.
7. Explain any two methods of protein purification. (2.5+2.5)
8. Describe the instructions for collecting fasting blood sample & 24 hours urine sample
9. External Quality Assessment program (EQA).
10. Chromatography- principle & application.

Short Answers(Answer Any Ten) **10X3=30 Marks**

11 Define Mean & Median
12 Write the reference range for (1) Serum Urea (2) FBS (3) PPBS
13 Define accuracy & precision
14 Creatinine clearance test
15 Define & classify Jaundice.
16 Define Postanalytical errors and mention any two causes
17 Define Anion gap. Mention the reference interval of anion gap
18 List any two techniques to separate proteins
19 Microalbuminuria
20 Define respiratory acidosis and mention any two causes
21 Biochemical changes in hyperthyroidism.
22 Benedicts test principle & significance

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Long Essay **2x10=20**

1. Define Carbohydrates. Classify them with suitable examples & write their biomedical importance. (1+7+2)
2. Define Enzymes. Describe in detail the various factors affecting enzyme activity. Illustrate with suitable graphs. (2+8)

Short Essay **6X5=30**

3. With a neat labelled diagram, describe the structure of Immunoglobulins. (2+3)
4. What are Biologically Important Peptides? Give four examples and their biological roles. .(1+4)
5. Write the sources, Recommended Daily Allowance and biochemical functions of Ascorbic acid. (1+1+3)
6. With a neat labelled diagram, describe the Watson & Crick model of DNA.
7. Briefly describe the Fluid Mosaic model of plasma membrane with a neat labelled diagram. (3+2)
8. What are Phospholipids? Classify them with suitable examples and enumerate four important functions. (1+2+2)

Short Answers **10X3=30**

9. What is Denaturation? List two factors causing Denaturation.
10. Why sucrose is a non-reducing sugar ?
11. What are dietary fibers? Give two examples
12. What is active transport? Give a suitable example.
13. Mention two therapeutic enzymes with their applications.
14. What are lipoproteins? Give two examples
15. Define respiratory quotient. Write the RQ of carbohydrates, lipids and proteins.
16. Define BMR. Mention any 4 factors affecting BMR
17. Coenzyme forms of i. Thiamine ii. Riboflavin iii. Niacin
18. Define essential fatty acids and Name them.

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Subject : BIOCHEMISTRY - II

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Long Essay **2X10=20 Marks**

1. List the sources of ammonia. Explain how ammonia is detoxified in the body. Add a note on disorders of urea cycle.
2. Write the reference values for Fasting and Post Prandial blood glucose. Explain the hormonal regulation of blood sugar.

Short Essay **6X5=30 Marks**

3. Explain the digestion and absorption of Lipids.
4. Define Lipoproteins. Classify them & write their functions
5. Define Jaundice. Classify jaundice& mention the causes for each type of jaundice.
6. Explain Glycogenesis.
7. Explain absorption, transport and storage of Iron.
8. Glucose tolerance test (GTT): Indications for conducting GTT & Procedure.

10X3=30 Marks

Short Answers

9 Write the enzyme defect and any 2 clinical features of Phenylketonuria
10 Name two iron storage disorders.
11 Mention normal levels of serum calcium. List any two factors affecting the absorption of calcium
12 Mention three biological important compounds derived from Cholesterol.
13 Mention three Heme containing proteins.
14 Name the ketone bodies. Write any two conditions where ketone bodies are elevated
15 What is substrate level phosphorylation? Give two examples
16 Define Gluconeogenesis. List the substrates for Gluconeogenesis
17 Write the reference range for: (1) serum sodium (2) serum potassium (3) serum chloride.
18 What is Von Gierke's disease? Mention the enzyme defect and clinical feature.

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Subject : BIOCHEMISTRY - III

Q.P Code : K3033

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Long Essay **2X10=20 Marks**

1. Describe in detail the primary sample collection, storage & transportation
2. Describe Colorimeter with respect to Principle, instrumentation, procedure, Application, advantage & disadvantage.

Short Essay **6X5=30 Marks**

3. Internal Quality Control
4. Define buffers. Mention the types of buffer systems in plasma & add a note on regulation of pH.
5. Classify renal function test & add a note on assessment of glomerular filtrate
6. Define Sensitivity, Specificity, Accuracy, Precision & total allowable Error.
7. Turbidometry, principle, advantage & application
8. Define Jaundice. Classify jaundice and mention one cause for each type of jaundice

Short Answers **10X3=30 Marks**

9 Mention the advantage of using L J Chart.
10 List three clearance tests.
11 Write the principle of chromatography.
12 List the three mechanism involved in regulation of blood pH.
13 Write any two applications of Flame photometry.
14 Write the principle of Turbidometry.
15 Write the reference range for (1) Serum Urea (2) SGOT (3) SGPT
16 Define Metabolic acidosis and mention any two causes.
17 Write the principle of Electrophoresis.
18 Define Mean, Median & Mode.

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