Rajiv Gandhi University of Health Sciences, Karnataka

MBBS Phase – I (CBME) Degree Examination - 14-Feb-2023

Time: Three Hours **Max. Marks: 100 Marks**

BIOCHEMISTRY – PAPER I (RS-4)

QP Code: 1024

(QP contains two pages)

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

LONG ESSAYS **2 x 10 = 20 Marks**

1. A medical student who had an exam on the next day did not eat anything the previous night. Next day morning, he had severe headache and giddiness before exam. His fasting plasma glucose was 48 mg/dl.
   a) Interpret the plasma glucose value
   b) Name the metabolic pathways which maintain blood glucose in fasting state
   c) Explain the metabolic pathway that synthesise glucose from pyruvate
2. Mention the active form of Vitamin D. Describe the synthesis, biochemical functions and RDA of Vitamin D.

SHORT ESSAYS **8 x 5 = 40 Marks**

3. A 48-year-old man diagnosed with myocardial infarction (MI) had an altered lipid profile with elevated total cholesterol and LDL cholesterol.
   a) Write the biological reference interval of LDL cholesterol.
   b) Explain the formation of LDL cholesterol.
   c) Reason out why LDL cholesterol is atherogenic.
4. A 70-year-old man suffered an attack of pneumonia. He found it difficult to breathe and was losing consciousness. His Arterial Blood Gas (ABG) report was as follows: pH=7.1, pCO2 = 52 mmHg, Plasma Bicarbonate (HCO_3^-) = 25 meq/L.
   a) Interpret the ABG report.
   b) Write the compensatory mechanism in the above acid-base disorder.
5. Mention biological reference interval for serum calcium. Describe any four functions of calcium.
6. Define Isoenzymes. Mention the Isoenzymes of creatine phosphokinase (CPK) and write their significance.
7. Define Basal Metabolic Rate (BMR). Enumerate the factors affecting BMR.
8. Explain the metabolic adaptations in well-fed state.
9. Explain competitive inhibition of enzymes with two examples.
10. Explain the functions of peroxisomes and describe their role in fatty acid oxidation.

SHORT ANSWERS **10 x 3 = 30 Marks**

11. What is fatty liver? Mention any two lipotropic factors.
12. What is hyponatremia? List two causes of hyponatremia.
13. Component of oral rehydration solution (ORS) has sodium chloride and glucose. What is purpose of adding glucose in ORS?
14. Mention any three site specific inhibitors of electron transport chain.
15. Name the enzyme defect in von Gierke's disease. Write the biochemical alterations in von Gierke's disease.
16. What is the cause of pellagra? Write the clinical manifestations of pellagra.
17. A diabetic patient was advised not to take polished rice but to take brown rice. Explain the reasons for the same.
18. Mention three homopolysccharides of glucose and write their biological importance.
19. Write the biochemical defect in Ehler Danlos Syndrome and Osteogenesis imperfecta.
20. Write the biochemical cause of respiratory distress syndrome in premature babies.

Rajiv Gandhi University of Health Sciences, Karnataka

Multiple Choice Questions **10 x 1 = 10 Marks**

21 i) Hexokinase belongs to which class of enzymes?
- A. Oxidoreductase
- B. Transferase
- C. Hydrolase
- D. Lyase

21 ii) Which of the following vitamins is used in the electron transport chain?
- A. Riboflavin
- B. Pantothenic acid
- C. Pyridoxine
- D. Biotin

21 iii) Glucose and fructose are monosaccharide units of
- A. Lactose
- B. Maltose
- C. Sucrose
- D. Isomaltose

21 iv) The sugar component of cerebroside is
- A. Galactose
- B. Lactose
- C. Fructose
- D. Ribose

21 v) The normal Anion gap is
- A. 4-8 mmol/L
- B. 10-14 mmol/L
- C. 16-20 mmol/L
- D. 22-26 mmol/L

22 i) Limiting amino acid in the protein gelatin is
- A. Lysine
- B. Threonine
- C. Tryptophan
- D. Methionine

22 ii) Which coenzyme is responsible for carboxylation reactions
- A. Biocytin
- B. FAD
- C. NAD
- D. TPP

22 iii) Hormone insulin activates which of the following pathway
- A. Glycogenolysis
- B. Gluconeogenesis
- C. Glycolysis
- D. Lipolysis

22 iv) In Wilson's disease copper accumulates in all of the following tissues **EXCEPT**
- A. Eyes
- B. Spleen
- C. Brain
- D. Liver

22 v) The marker enzyme for microsomes is
- A. ATP synthase
- B. Cathepsin
- C. Glucose-6-phosphatase
- D. Lactate dehydrogenase

*****