QP CODE : 1024

Rajiv Gandhi University of Health Sciences, Karnataka

MBBS Phase – I (CBME) Degree Examination - 04-May-2023

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

BIOCHEMISTRY – PAPER I (RS-4)

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(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 10-year-old boy was admitted to a hospital with a diagnosis of malaria. He was started on primaquine and antipyretics. Within one day he was found to have developed hemolytic anemia.
   a) Name the pathway affected in the above case and write the enzyme defect in the pathway.
   b) Name the compounds formed in this pathway and write their importance.
   c) What is the relation between primaquine and hemolytic anemia?
2. Describe cholesterol biosynthesis up to the formation of mevalonate. Explain the regulation of cholesterol biosynthesis. Mention two causes of Hypercholesterolemia.

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

3. An 8-year-old girl presented with difficulty in vision during night time. Vitamin A deficiency was suspected following examination.
   a) Write the provitamin form of Vitamin A
   b) Explain Wald' s visual cycle
4. A 20-year-old pregnant woman presented with history of fatigue. Her peripheral blood smear showed microcytic hypochromic anemia.
   a) Which mineral deficiency leads to this type of anemia?
   b) Explain the absorption, transport and storage of this mineral.
5. Describe the role of dietary fibre in nutrition.
6. State chemiosmotic theory and illustrate the process of oxidative phosphorylation.
7. Define metabolic acidosis. Enumerate the causes for metabolic acidosis. Write the compensatory mechanism in metabolic acidosis.
8. Describe the role of any five plasma enzymes in the diagnosis of disease.
9. Explain niacin under the following headings:
   a) Dietary sources
   b) Co-enzyme forms
   c) Deficiency manifestation
10. Explain the metabolic changes in starvation.

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

11. Write the composition and functions of collagen.
12. Enumerate the biomarkers used in the diagnosis of myocardial infarction (MI). Which biomarker is considered specific for MI and why?
13. Name three functions of the vitamin whose deficiency causes scurvy.
14. Name three mucopolysaccharides and write their functions.
15. Name three phospholipids and write their biological importance.
16. Mention two causes of hypokalemia. Write biological reference interval for serum potassium.
17. Define Km. Explain its importance with an example.

18. Mention the role of carnitine in β-oxidation.

19. Write biological importance of selenium.

20. Define active transport. Give two examples for active transport.

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

21 i) All the following lipids are present in the cell membranes **EXCEPT**
- A. Lecithin
- B. Cholesterol
- C. Sphingomyelin
- D. Triacylglycerol

21 ii) Which of the following derivative of monosaccharide is used to reduce raised intra-cranial pressure?
- A. Sorbitol
- B. Dulcitol
- C. Ribitol
- D. Mannitol

21 iii) Enzymes which are synthesized in an inactive form are called
- A. Apoenzyme
- B. Proenzymes
- C. Coenzyme
- D. Isozyme

21 iv) The product of glycolysis in erythrocytes is
- A. Lactate
- B. Pyruvate
- C. Urate
- D. Acetate

21 v) The vitamin that acts as a coenzyme for transketolase activity is
- A. Pyridoxine
- B. Thiamine
- C. Biotin
- D. Folate

22 i) Normal biological reference interval for serum sodium is
- A. 96-105 meq/L
- B. 116-135 meq/L
- C. 136-145 meq/L
- D. 156-165 meq/L

22 ii) Number of calories given by one gram of carbohydrate is
- A. 2
- B. 4
- C. 6
- D. 9

22 iii) Nitrogenous base ethanolamine is present in
- A. Phosphatidyl inositol
- B. Plasmalogen
- C. Cephalin
- D. Lecithin

22 iv) The ratio of bicarbonate to carbonic acid in bicarbonate buffer system is

A. 20:1
B. 10:1
C. 4:1
D. 1:1

22 v) Which of the following **does not** increase the absorption of calcium?

A. Vitamin D
B. Absence of bile salts
C. Basic amino acids
D. Acidity

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