

**Total No. of Printed Pages - 2**

**SS/MBBS-I/1<sup>st</sup> IA/ BIO /08-24**

**2024**

**(August)**

**BIOCHEMISTRY**

**Paper-I**

**Full Marks: 90**

**Time: 2 hours 50 minutes**

**The figures in the margin indicate**

**full marks for the questions**

**Answer all questions**

1. Describe the levels of organization of protein structure. Enumerate the functions of protein in the human body. Write briefly about the structure-function relationship of protein with special reference to haemoglobin.

[6 + 5 + 4 = 15]

2. Describe  $\beta$ -oxidation of even-numbered fatty acid with its energetics. Add a note on disorders associated with it. What is the significance of  $\alpha$ -oxidation?

[(6 + 3) + 3 + 3 = 15]

3. A 5-year-old boy was admitted to the paediatric ICU with complaints of weakness, fatigability, generalized body swelling, and decreased urinary output. Initially, the swelling started around the eyes and later progressed to the whole body. His blood sample was sent for investigations. The laboratory report revealed—Total proteins: 5 g/dl, albumin: 2 g/dl, globulin: 3 g/dl, total cholesterol: 400 mg/dl, LDL: 220 mg/dl, prothrombin time: 40 seconds, and urine output: 90 ml/min.

(a) Mention the probable diagnosis.

(b) What is the cause for oedema in this case?

(c) Explain the reasons for hypercholesterolemia.

(d) Discuss why there is an increase in prothrombin time.

4. What are the important roles of a doctor in a primary health centre? 5

5. Write short notes on the following: 5x7=35

- (a) Enzymes used for diagnosis
- (b) Synthesis of prostaglandins and inhibitors of their synthesis
- c) Rapaport Leubering cycle and its significance
- d) Energy production in anaerobic and aerobic glycolysis
- e) Short-term and long term complications of diabetes mellitus
- d) LDL cholesterol and its role in formation of atherosclerosis
- g) Mechanism of action of ligand gated ion channels

6. Justify the following statements: 2x5=10

- (a) TCA cycle is sometimes called a 'metabolic traffic circle'.
- (b) Statins are used for lowering blood cholesterol levels.
- (c) Valinomycin acts as a mobile ion carrier.
- (d) Glucagon and glucocorticoids increase gluconeogenesis.
- (e) Lecithin sphingomyelin ratio is significant in respiratory distress syndrome.

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