



**INSTRUCTIONS**

- There are four (04) questions in Parts A and B of the SEQ paper.
- Answer **each** part in separate booklet provided.
- No paper should be removed from the examination hall.
- Do not use any correction fluid.
- Use illustrations where necessary.

**Part A**

**01.**

- 1.1 Name **two** haemoproteins and their functions in adult human body. (10 marks)
- 1.2 Explain briefly the structure-function relationship of haemoglobin F (foetal haemoglobin). (40 marks)
- 1.3 List the factors that affect the affinity of haemoglobin for oxygen. (10 marks)
- 1.4 Explain the biochemical basis for the occurrence of vaso-occlusive crisis in sickle cell diseases. (40 marks)

**02.**

- 2.1 State the major plasma protein in adults and **two** functions of it. (10 marks)
- 2.2 Name **two** conditions which lead to hypoproteinaemia in adults. (10 marks)
- 2.3 Explain the biochemical basis of the following.
- 2.3.1 Appearance of Bence-Jones protein in urine in monoclonal gammopathy. (30 marks)
- 2.3.2 Occurrence of emphysema in  $\alpha$ 1-antitrypsin deficiency. (25 marks)
- 2.3.3 Use of electrophoresis in the diagnosis of  $\alpha$ 1-antitrypsin deficiency. (25 marks)

## Part B

03.

3.1 Synthesis of body proteins consists of several steps.

3.1.1 State the steps in translation process of protein biosynthesis. (10 marks)

3.1.2 Explain briefly the term "post translational modifications of protein" giving two examples. (20 marks)

3.2. Explain briefly how antibiotics inhibit protein biosynthesis with one example.

(30 marks)

3.3. A 65 year-old male patient was admitted to a medical ward in a semiconscious state and his blood ammonia concentration was very high.

Explain briefly the biochemical basis for the development of semiconscious state in this patient. (40 marks)

04.

4.1 Amount of total body protein remains constant while being subjected to rapid turnover in a healthy adult.

4.1.1 State the significance of estimation of nitrogen balance. (15 marks)

4.1.2 State the main reaction involved in the removal of  $\alpha$ -amino group from an amino acid. (05 marks)

4.1.3 What is the co-enzyme required for reaction mentioned in 4.1.2? (05 marks)

4.1.4 Explain briefly the mechanism of reaction mentioned in 4.1.2. (20 marks)

4.2. Drugs that affect the metabolism of purine or pyrimidine are used in the treatment of related diseases.

4.2.1 State the enzyme that catalyzes the last step of purine degradation pathway.

(05 marks)

4.2.2 What is the end product of degradation of purine nucleotides? (05 marks)

4.2.3 State the main route of excretion of the end product mentioned in 4.2.2.

(05 marks)

4.2.4 State the clinical condition occurring due to the overproduction of the compound mentioned in 4.2.2. (05 marks)

4.2.5 Explain briefly the rationale of using methotrexate in cancer chemotherapy.

(35 marks)

@@@@@@@@@@