001/24

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation),
November - December 2024

Subject: Biochemistry **Full Marks: 100**
Paper: II **Time: 3 hours**

Attempt all questions. The figures in the margin indicate full marks.

1. a) A 50 years old female patient was admitted to the hospital with symptoms of Diphtheria, a disease caused by Corynebacterium diphtheriae. The Diphtheria toxin inhibits translation in mammalian systems. 6+3+6
i) Describe the process of translation in eukaryotes with flow diagram.
ii) Name three inhibitors of protein synthesis and mention their mechanism of action.
iii) Enumerate post translational modifications.

b) Enumerate any three different antigen presenting cells (APC). State one important specific function of each. Write a brief note about the role of Reactive Oxygen Species (ROS) on destruction of pathogen. What are the different types of vaccines used? Give one example of each. 3+3+5+2+2

2. a) List the name of four hormones acting through G-protein coupled receptor. Describe the process of signal transduction by any one of those hormones. Give examples of enzymes which are activated and inhibited by that hormone. 2+6+2

b) Write the interrelationship of Vitamin B12 and Folic acid in biochemical process. State the role of Vitamin B12 in metabolism of odd chain Fatty acid. Briefly describe FIGLU. 4+4+2

c) A 6 month old baby was brought to the hospital with a history of fall and swollen leg. Mother gave history of the child sustaining multiple fractures of various bones from 1 month to now. X ray revealed few trabeculae and thin cortices. 2+3+5
i) What is the most probable diagnosis?
ii) What is the biochemical basis of the disease?
iii) Enumerate the types, structures, synthesis and function of collagen.

3. Write short notes on the following: 2x
a) Osteogenesis imperfecta.
b) Anti-oxidant vitamins and their interdependency.

4. Explain the following statements: 5x
a) NADPH plays an important role in some phase I xenobiotic reactions.
b) Restriction fragment length polymorphism (RFLP) can be a very effective tool in forensic sciences.
c) Antibiotics do not inhibit eukaryotic translation.
d) Zinc supplementation is given to boost immunity.
e) Coumarin group of drugs act as anti-coagulant.

10x1

5. Choose the correct option for each of the following:

i) Pattern of inheritance of MHC genes is:
a) Autosomal dominant. b) Autosomal recessive.
c) Sex linked recessive. d) Codominant.

ii) Which of the following hormones use tyrosine kinase as second messenger?
a) Insulin and growth hormone. b) TSH and growth hormone.
c) Insulin and TSH. d) TSH and Catecholamine.

iii) The true value of urea of a control is 40. You perform urea estimation 5 times from same control material by same method and same instrument. Values are 40, 42, 39, 40 and 41. It indicates:
a) Precision. b) Accuracy.
c) Precision and accuracy both. d) None.

iv) Insulin activates:
a) Glycogen synthase. b) Glycogen phosphorylase.
c) Branching enzyme. d) Debranching enzyme.

v) Western blot transfer technique is utilized for visualization of:
a) DNA. b) RNA.
c) Protein. d) Glycoprotein.

vi) Normal role m-RNA is:
a) RNA splicing. b) Transcription.
c) Gene regulation. d) RNA editing.

vii) UGA can code for:
a) Tryptophan and Pyrrolysine. b) Selenocysteine and Methionine.
c) Selenocysteine and Tryptophan. d) Pyrrolysine and Selenocysteine.

viii) Choose the vitamin involved in post translational modification:
a) Vitamin C. b) Vitamin A.
c) Folic acid. d) Pyridoxine.

ix) Identify the transporter which is defective in renal glycosuria:
a) GLUT 1 b) SGLT 1.
c) GLUT 2 d) SGLT 2.

x) PCR technique requires all except:
a) Primers b) Primase
c) A template DNA d) Deoxy ribonucleoside triphosphates.