001/22

The West Bengal University of Health Sciences
MBBS 1st Professional Examination (New Regulation), February -March 2022

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

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

1. a) A 46 year old male patient was admitted to the hospital with symptoms of diphtheria, a condition caused by corynebacterium diphtheria. The diphtheria toxin inhibits translation in mammalian systems.
   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. 6+3+6.
   b) List the name of four hormones that act through G-protein coupled receptor complex. Describe the process of signal transduction by any one of those hormones. Briefly state the role of Calcium in signal transduction. 2+8+5

2. a) Name two vitamins which have role as antioxidants. Briefly describe the sources, their mode of action as antioxidants and deficiency manifestations. 2+1+5+2
   b) Name the four different types of hypersensitivity. Give one example of each type of hypersensitivity. Describe the mechanism of types I hypersensitivity. 2+2+6
   c) Diagrammatically discuss the absorption transport and storage of Iron. Enlist the iron containing proteins, justify the role of cytochrome in electron transport chain. 6+4

3. Write short notes on the following: 2x5
   a) Southern blotting technique.
   b) Protein energy malnutrition.

4. Explain the following statements: 5x4
   a) Vitamin B12 should be given along with folic acid to treat folic acid deficient anemia.
   b) Cancer may be caused by excessive activity of protein tyrosine kinase activity.
   c) Glutathione is an important mediator for detoxification of toxic materials in humans.
   d) Wilson's disease is a disorder of copper metabolism.
   e) Yeast artificial chromosome can act as a high capacity vector in DNA cloning.

5. Choose the correct option for each of the following: 10x1

i) Tumour marker for ovarian cancer
   a) β hcG
   b) AFP
   c) Ca-125
   d) CEA.

ii) What is full name of cDNA ?
   a) Cloned DNA
   b) Complementary DNA
   c) Catalytic DNA
   d) Cleaved DNA.

iii) Which of the following belongs to a trace elemept in humans:
a) Calcium
b) Sodium
c) Potassium.
d) Copper.

iv) The specialized structures located at the ends of the eukaryotic chromosomes are called
a) Terminators
b) Telomeres
c) Terminal sequence
d) Stop signal.

v) Which of the following is a tumour suppressor protein :
a) p53.
b) pRb.
c) Myc.
d) Both a and b.

vi) Cytochrome P450 helps in xenobiotic reactions by which of the following mechanisms:
a) Functioning as a dioxygenase
b) Functioning as a mono-dioxygenase
c) Using NADH as a cofactor
d) Using calcium ion as a second messenger

vii) Which of the following hormones use protein tyrosine kinase as second messenger ?
a) Insulin and growth hormone
b) TSH and growth hormone
c) Insulin and TSH
d) TSH and Catecholamines

viii) Which of the following techniques is used to identify a particular segment of DNA from an agarose gel electrophoresis?
a) Western blot
b) Southern blot
c) Northern blot
d) Polymerase chain reaction

ix) Kwashiorkor is characterized by all of the following except
a) Protein deficiency
b) Marked anorexia
c) Hypoglycemia
d) Fatty liver

x) Vitamin k administration is routinely advised in premature babies. Which of the following reasons explains this most appropriately?
a) Vitamin K helps to initiate respiration more smoothly in premature babies
b) Vitamin K helps to prevent haemorrhage in premature infants
c) Vitamin K helps to promote skeletal muscle activity in premature infants
d) Vitamin K helps to prevent acid base disorder in premature infants.