

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

**Subject: Biochemistry**

**Paper : II**

**Full Marks : 100**

**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. 6+3+6
  - ii) Name three inhibitors of protein synthesis and mention their mechanism of action. 6+3+6
  - 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)  $\beta$  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 element 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.