

**The West Bengal University of Health Sciences**  
**MBBS 1<sup>st</sup> Professional Examination (New Regulation), March 2021**

**Subject: Biochemistry**  
**Paper : II**

**Full Marks : 100**  
**Time : 3 hours**

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

1. a) What is a balanced diet ? What is the nutritional importance of dietary proteins? Discuss the protein-energy malnutrition with special reference to kwashiorkor disease. 3+6+6
- b) Explain the replication of a DNA molecule in the context of initiation, elongation and termination in prokaryotes with suitable diagrams. Enumerate the differences between DNA polymerase I, II & III. 10+5
  
2. a) Expand the term PCR. Describe different steps for a PCR reaction. Enumerate any four uses of the PCR. 1+7+2
- b) Describe the structural characteristics of an immunoglobulin molecule in general with a diagram. Explain the functional differences between T cell and B cell mediated immunity. 5+5
- c) Enumerate the different modes of repair of DNA damage in humans. Explain the mechanism of any one of them with the disorder arising due to the defects on that pathway. 4+4+2
  
3. Write a short notes on the following: 2 x 5
  - a) Tumour marker .
  - b) Cell cycle.
  
4. Explain the following statements: 5 x 4
  - a) Macrophages show beneficial effects by generating free radicals.
  - b) Endocrinal disorders may predispose to obesity.
  - c) Deficiency of ascorbic acid causes fragility of blood vessels.
  - d) Under some conditions immunity causes damaging effects.
  - e) Proto-oncogenes are regulatory genes

**P.T.O.**

5. Choose the correct option of each of the following:
- i) Enzyme that protects DNA from aging is:
    - a) Topoisomerase
    - b) DNA ligase
    - c) Telomerase
    - d) Restriction endonuclease.
  
  - ii) Which is not a transcription start signal?
    - a) CAAT box.
    - b) Hogness box.
    - c) Pribnoe box.
    - d) Homeo box.
  
  - iii) Frameshift mutation results from:
    - a) Substitution of a single base.
    - b) Deletion of a single base.
    - c) Addition of a codon.
    - d) Deletion of a codon.
  
  - iv) Which of the these is a clinical feature of pellagra?
    - a) Dystonia.
    - b) Dysarthria.
    - c) Dementia.
    - d) Deafness.
  
  - v) Connective tissue protein defective in Marfan's syndrome:
    - a) Tubulin.
    - b) Fibrillin.
    - c) Connexin.
    - d) Keratin.
  
  - vi) Prion diseases in human beings are:
    - a) Fatal familial Insomnia.
    - b) Guillain-Barre syndrome.
    - c) Multiple sclerosis.
    - d) Ehlers-Danlos syndrome.
  
  - vii) In molecular biology, Cloning vectors may include all except:
    - a) Plasmid.
    - b) Cosmid.
    - c) Human artificial Chromosome.
    - d) Yeast artificial chromosome.

viii) A capping of 7 methyl guanosine triphosphate is found at the 5' end of which of the following types of RNA in eukaryotes?

- a) tRNA.
- b) rRNA.
- c) mRNA.
- d) snRNA.

ix) Which of the following is NOT a characteristic of genetic code?

- a) Genetic code is universal.
- b) Genetic code is un-ambiguous.
- c) Genetic code is non-degenerate.
- d) Genetic code is commaless.

x) Which of the following antibiotics can inhibit protein synthesis in eukaryotes?

- a) Streptomycin.
- b) Erythromycin.
- c) Chloramphenicol.
- d) Puromycin.