

BIOCHEMISTRY

PAPER-IV

BCHEM/D/18/03/IV

Time: 3 hours

Max. Marks:100

Important Instructions:

- *Attempt all questions in order.*
- *Each question carries 10 marks.*
- *Read the question carefully and answer to the point neatly and legibly.*
- *Do not leave any blank pages between two answers.*
- *Indicate the question number correctly for the answer in the margin space.*
- *Answer all the parts of a single question together.*
- *Start the answer to a question on a fresh page or leave adequate space between two answers.*
- *Draw table/diagrams/flowcharts wherever appropriate.*

Write short notes on:

1. a) What are embryonic stem cells? Explain their properties and clinical potential. 6+4
b) Discuss the relationship of mutations with sickle cell anemia and chronic myeloid leukemia.
2. a) Use of nanotechnology in molecular imaging with suitable examples. 5+5
b) Development of immunotherapeutic vaccines - potentials and challenges.
3. a) What is cryopreservation? Elaborate on the principle, types and uses. 6+4
b) Giving suitable examples describe two uses of real-time PCR in the diagnosis of diseases.
4. Name and describe the principle of the techniques used to: 5+5
a) Identify DNA sequences.
b) Amplify DNA sequences.
5. a) Describe gas chromatography and mass spectrometry (GC/MS) and their applications. 6+4
b) Applications of Microarray.
6. a) Flow cytometry: its principle and applications. 5+5
b) Principles and uses of native-PAGE and SDS-PAGE.
7. a) Explain the mechanism of inducible gene expression cloning. 6+4
b) Application of 2D gel electrophoresis.
8. a) Point of care testing: Latest developments, potentials and challenges. 6+4
b) Biosensors.
9. a) CRISPR systems in genetic engineering. 5+5
b) Transposons.
10. a) Affinity chromatography and its applications. 6+4
b) Name and mention the uses of two types of ELISA.
