BIOCHEMISTRY
PAPER-III

Time: 3 hours BCHEM/J/20/03/III
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. Explain how: 7+3
   a) Replication of both leading and lagging strands of DNA are carried out by a single DNA polymerase enzyme complex in a single direction of the replication fork.
   b) Fluoroquinolones function as effective inhibitors of prokaryotic DNA replication.

2. a) Mechanism and clinical implications of defects in nucleotide excision repair system. 6+4
   b) Role of DNA recombination in DNA repair system.

3. a) Next generation sequencing of DNA, 5+5
   b) Role of introns in splicing mechanisms.

4. Describe in brief the importance of: 6+4
   a) Genome wide association study.
   b) mRNA editing in regulation of lipid metabolism.

5. Write brief explanatory notes on: 4+6
   a) Maintenance of stringency of genetic code by Aminoacyl tRNA synthetases,
   b) Protein targeting failure.

6. Describe the regulation of eukaryotic gene expression by: 5+5
   a) Si (small interfering) RNAs.
   b) Epigenetic mechanisms.

7. Explain how: 6+4
   a) Antibody diversity occurs.
   b) Expression sequence tagging (EST) helps in the mapping of genome.

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8. a) DNA vaccines. 4+6
   b) Cytokine storm and its clinical importance.

9. Explain in brief: 5+5
   a) Targeted cancer therapy.
   b) Biochemical basis of metastasis of malignant cells.

10. a) BRCA1 and BRCA2 as tumour suppressor genes. 5+5
    b) Production of monoclonal antibodies by hybridoma technique.

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