

BIOCHEMISTRY
PAPER-IVTime: 3 hours
Max. Marks:100

BCHEM/J/20/03/IV

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. Describe the stages of development of vaccine against viral diseases and challenges in development of vaccine against virus causing COVID-19 (SARS-CoV-2). 7+3
2. List the antiviral drugs used in COVID-19 and write their mechanism of action. 3+7
3. Describe the techniques that can be used to produce Spike protein of SARS-CoV-2 virus by genetic engineering techniques. 10
4. a) Two dimensional gel electrophoresis 5+5
b) Role of chromatography in separation of nucleic acids.
5. a) Multiplex PCR. 5+5
b) Ct value and absolute count of virus by RT-PCR.
6. Describe the differences between: 5+5
a) Chemiluminiscence and Bioluminiscence
b) Turbidimetry and Nephelometry
7. Describe the use of mass spectrometry in analyzing the amino acid, protein and metabolomics. Add a short note on MALDI-TOF. 7+3
8. Write basic principle, instrumentation requirement and clinical application of Fluorescent in situ hybridization (FISH) technique. 5+2+3
9. Describe the techniques used in characterization of a novel protein. 10
10. Write the potential and present uses of artificial intelligence, large data analysis and bioinformatics tool in biochemistry diagnostic research. 3+3+4
