

B.Sc. Semester - 6 (CBCS) Examination**March/April-2026 (NEW COURSE)****Analytical Techniques and Bioinformatics (Core (New))****Time: 2:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

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- Que.1(A) Give specific answers. (04)
1. Define Beer-Lambert's law.
 2. Expand the abbreviation "NMR."
 3. State the wavelength range corresponding to visible light.
 4. Spectroscopic methods provide results that are more reliable, reproducible, and accurate compared to classical methods. (True/False)
- Que.1(B) Answer in Brief. (Any one out of two) (03)
1. Discuss about Colorimetry.
 2. Give the brief note on principles and applications of flame photometry.
- Que.1(C) Write a Note on. (Any one out of two) (07)
1. Write detail note on NMR Spectroscopy.
 2. Explain: Radioisotopes in Biosciences.
- Que.2(A) Give specific answers. (04)
1. Define: Partition Coefficient.
 2. Which chromatography technique utilizes ligands for product separation?
 3. What is the role of a guard column in chromatography?
 4. A UV detector is commonly used in gas chromatography (GC). (True/False)
- Que.2(B) Answer in Brief. (Any one out of two) (03)
1. Mention an application of Gas-Liquid Chromatography.
 2. Briefly describe Size-Exclusion Chromatography.
- Que.2(C) Write a Note on. (Any one out of two) (07)
1. Provide a detailed description of HPLC.
 2. Discuss Ion Exchange Chromatography in detail.
- Que.3(A) Give specific answers. (04)
1. What is the definition of the isoelectric point?
 2. Expand the abbreviation "2D-PAGE."
 3. Lipids can also be separated using electrophoresis. (True/False)
 4. In PAGE, gel polymerization occurs between acrylamide and _____.
- Que.3(B) Answer in Brief. (Any one out of two) (03)
1. Briefly describe Pulsed-Field Gel Electrophoresis (PFGE).
 2. Provide an overview of biosensor technology.
- Que.3(C) Write a Note on. (Any one out of two) (07)
1. Write detailed note SDS-PAGE?
 2. Explain the principles and theory of agarose gel electrophoresis.
- Que.4(A) Give specific answers. (04)
1. Expand the abbreviation "RAPD."
 2. Differentiate between a probe and a primer.
 3. The PCR technique was developed by _____ Scientist.
 4. How many DNA duplexes are produced from a single DNA duplex after five PCR cycles?

- Que.4(B) Answer in Brief. (Any one out of two) (03)
1. Describe the mechanism of FISH.
 2. Write a short note on RFLP.
- Que.4(C) Write a Note on. (Any one out of two) (07)
1. Describe Sanger's sequencing method in detail.
 2. Explain the mechanism and methodology of PCR technology.
- Que.5(A) Give specific answers. (04)
1. Define: Bioinformatics
 2. Expand the abbreviation "BLAST."
 3. What is the definition of bioinformatics?
 4. EMBOSS is an example of a homology and similarity tool. (True/False)
- Que.5(B) Answer in Brief. (Any one out of two) (03)
1. What are structural and miscellaneous databases?
 2. List various tools used for phylogenetic tree construction.
- Que.5(C) Write a Note on. (Any one out of two) (07)
1. Provide details about sequence alignment tools.
 2. Explain the databases used for information retrieval from biological databases.
