[65/A14]

SEAT No. _____ **No. of Printed Pages : 2**

SARDAR PATEL UNIVERSITY
B.Sc. (5th Semester) EXAMINATION 2018
SUBJECT: MICROBIOLOGY US05CMIC02
(Bioinstrumentation)

Date: 24/10/2018, Wednesday Time: 10:00 a.m. TO 1:00 p.m.

Note: (1) All the questions are compulsory.
(2) Figures on the right side indicate marks. TOTAL MARKS: 70

Q:1 Select the correct answer for each question from the option given below [10]

1. Which basic principle is involved in the IR spectroscopy?
   (A) Lambert's law (B) Boltzman distribution
   (C) Bond vibration (D) Beer's law
2. Which of the following spectroscopic technique measures the intensity of scattered light (Is) as a function of concentration (C) of the suspended particles.
   (A) Flame Photometry (B) UV-Visible spectroscopy
   (C) Nephelometry (D) HPLC
3. TEMED acts as_____ in PAGE?
   (A) Initiator (B) Crosslinker (C) Monomer (D) Catalyst
4. Centrifugation technique separates molecules on the basis of:
   (A) Size (B) Shape (C) Density (D) All of the above
5. Gel permeation chromatography separate proteins on the basis of:
   (A) Size (B) Shape (C) Density (D) All of the above
6. The ratio of concentration of analyte between stationary phase and mobile phase is known as:
   (A) Retardation factor (B) Partition coefficient
   (C) Capacity factor (D) Sedimentation coefficient
7. Radioactive isotopes can emit _____ rays.
   (A) Alpha (B) Beta (C) Gamma (D) ALL
8. Example of composite database is:
   (A) PIR (B) OWL (C) PDB (D) Genbank
9. Which technique separates DNA on the basis of difference in their size?
   (A) Native PAGE (B) SDS PAGE (C) Agarose gel electrophoresis (D) IEF
10. Proteins with net negative charge can be separated by:
    (A) Anion exchanger (B) Cation exchanger (C) Both A & B (D) None

Q:2 Give short answers to following questions (Any ten) [20]

1. Give at least two differences between prism and grating.
2. Draw neat and labeled diagram of different components of flame photometry.
3. Explain photomultiplier tube.
4. Write the principle of separation of protein by isoelectric focusing.
5. Explain how DNA fragments can be detected after gel electrophoresis.
6. Enlist factors affecting centrifugation process.
7. What do you mean by Isocratic and gradient elution in chromatography?
8. Write principles of gas chromatography.
9. Write advantages of HPLC.
10. Define bioinformatics and enlist major data bases in bioinformatics.
11. Write analytical applications of isotopes.
12. Enlist general features of biosensors.

Q.3 Discuss with suitable diagram-principle, working and applications of UV-visible spectroscopy in detail. [10]

OR

Q.3 Discuss with suitable diagram-principle, working and applications of Infra Red spectroscopy. [10]

Q:4 Explain separation of proteins by gel electrophoresis in detail. [10]

OR

Q:4 Discuss:
(a) Different methods of density gradient centrifugation. [06]
(b) Differential centrifugation. [04]

Q:5 (a) Explain principle and applications of ion-exchange chromatography. [05]
(b) Explain principle and application of affinity chromatography. [05]

OR

Q:5 (a) Explain detectors used in gas liquid chromatography. [05]
(b) Describe various types of gel used in gel permeation chromatography. [05]

Q-6 (a) Discuss the safety measures of handling radioactive isotopes in laboratory. [05]
(b) Discuss applications of biosensors. [05]

OR

Q-6 Discuss different types of databases used in bioinformatics. [10]

— X —
(2)