

SEAT No. \_\_\_\_\_

No. of Printed Pages: 2

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**SARDAR PATEL UNIVERSITY**  
**T. Y. B.Sc. Biochemistry (SEMESTER - V)**  
**BIOCHEMISTRY: US05CBCH06**  
**BIOINSTRUMENTATION**

Date: 31/12/2020 (Thursday)

Time: 02:00 P.M. To 04:00 P.M.

**TOTAL MARKS: 70**

**Q.1 Multiple Choice questions : (1 Mark each)**

**10**

1. Ion exchange chromatography is based on the
  - a. electrostatic attraction
  - b. adsorption chromatography
  - c. ionic species
  - d. partition chromatography
2. A type of monochromatic device present in spectrophotometer is
  - a. Grating
  - b. Absorption filter
  - c. Interfere filter
  - d. Prism
3. Beer's law states that the intensity of light decreases with respect to
  - a. Concentration
  - b. Composition
  - c. Distance
  - d. Volume
4. Which of the following gases is unsuitable for uses as GC carrier gas?
  - a. Nitrogen
  - b. Oxygen
  - c. Helium
  - d. All of above
5. What is the nature of agarose?
  - a. Disaccharide
  - b. Polysaccharide
  - c. Agarobiose
  - d. Protein
6. What is rate-zonal centrifugation?
  - a. Based on separation of particles by mass
  - b. Based on separation of particles by density
  - c. Based on separation of particles on solubility
  - d. Based on separation of particles on size
7. Which one of the following arrangements for the sequence of the main components of a UV/visible spectrophotometer is Correct?
  - a. Readout → Detector → Sample cell → Monochromator → Light source
  - b. Readout → Monochromator → Sample cell → Detector → Light source
  - c. Readout → Monochromator → Detector → Sample cell → Light source
  - d. Monochromator → Detector → Sample cell → Readout → Light source
8. Which of the following dye used for visualization of DNA during DNA gel electrophoresis?
  - a. Brilliant blue
  - b. Ethidium Bromide
  - c. Bromo cresol green
  - d. Methylene blue
9. In equation ,  $G = \omega^2 r$  where  $\omega$  equals to
  - a. radial distance from the axis of rotation
  - b. Centrifugal force
  - c. Angular velocity
  - d. None of these
10. What is the purpose of using bromophenol blue in the sample buffer?
  - a. To ionize the sample
  - b. Act as Control
  - c. To monitor the electrophoretic run
  - d. for adjust pH

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[P.T.O.]

**Q.2 Do as Direct ((Fill in the blanks and True or False)****8**

1. The absorbance does not change when the cell path length (cell thickness) increases (T/F)
2. Grating is a device used in the spectrophotometer to function as \_\_\_\_\_.
3. rpm = \_\_\_\_\_ per minute
4. For the separation of lipoprotein by centrifugation, \_\_\_\_\_ method is mostly used.
5. SDS-PAGE is electrophoresis method used for separation of protein. (T/F)
6. In DNA agarose gel electrophoresis, \_\_\_\_\_ used as intercalating agent to visualized location of DNA on gel.
7. In Column chromatography, the stationary phase is made of liquid and the mobile phase is made of solid. (T/F)
8. High pressure liquid chromatography can be performed only in columns. (T/F)

**Q.3 Answer in very short (Attempt any Ten)****20**

1. What is the difference between prism and grating used in spectrophotometer?
2. Explain sedimentation velocity.
3. List the different Infrared region. Write down the principle of IR spectroscopy.
4. What is isoelectric focusing?
5. Give the types of ultracentrifugation and its application.
6. What is bathochromatic and hyperchromatic shift?
7. What is the importance of stacking gel during PAGE?
8. Give any one staining method of SDS-PAGE in brief.
9. Write principle of sedimentation and centrifugation?
10. What is Ion exchanger? Give its application.
11. Why pumping system is most important part of HPLC techniques?
12. Write down the basic principle of affinity chromatography.

**Q.4 Answer the following question in detail. (Attempt any four out of eight)****32**

1. Write down the beer's law. Explain the functioning of different components of U.V. spectrophotometer.
2. Discuss the importance of various types of monochromators.
3. Explain various factors affecting speed of centrifuge.
4. Write in detail on: a. Rate zonal rotor b. Angular rotor
5. Write a short note on: SDS Polyacrylamide gel electrophoresis
6. Discuss the properties and uses of different gel materials used for electrophoresis.
7. Give an account on : Principle and types of column used in Gas chromatography
8. Write down the basic principle of chromatography. Discuss the procedure and application of Ion Exchange chromatography.

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