

(13/A-3)

No. of Printed Pages : 2

SARDAR PATEL UNIVERSITY

T. Y. B.Sc. Biochemistry (SEMESTER - V)

BIOCHEMISTRY: US05CBCH06

BIOINSTRUMENTATION

Date: 03/11/18 (Saturday)

Time: 10:00 AM to 01:00 PM

TOTAL MARKS: 70

Q.1 Multiple Choice questions : (1 Mark each) 10

1. IR does not have
  - a. Grating
  - b. Interference Filter
  - c. Prism
  - d. Absorption Filter
2. Beer's law states that the intensity of light decreases with respect to
  - a. Concentration
  - b. Composition
  - c. Distance
  - d. Volume
3. Rate zonal method is mainly based on separation of cell on the basis of
  - a. Difference in molecular weight
  - b. Difference in shape
  - c. Difference in density
  - d. Difference in size
4. In gel permeation chromatography, which molecules will be eluted last?
  - a. Small molecules
  - b. Larger molecules
  - c. Intermediate molecules
  - d. All of these
5. Which chromatographic technique depends on the highly specific interactions between pairs of biological materials such as enzyme-substrate?
  - a. Adsorption chromatography
  - b. Ion-exchange chromatography
  - c. Affinity chromatography
  - d. Gel-permeation chromatography
6. Which of the following gases is unsuitable for uses as GC carrier gas?
  - a. Nitrogen
  - b. Oxygen
  - c. Helium
  - d. All of above
7. The electrophoresis techniques that used isoelectric focusing is
  - a. AGE
  - b. 2D-PAGE
  - c. SDS-PAGE
  - d. PFGE
8. In SDS of protein separation, one SDS molecules will bind to
  - a. Every amino acid
  - b. Every three amino acid
  - c. Every two amino acid
  - d. Every four amino acid
9. How does centrifugation work?
  - a. Through dripping particles
  - b. Through spinning
  - c. By keeping large particle in the center and smaller on the outside
  - d. By separating particles into different tubes
10. Monochromatic device present in spectrophotometer is
  - a. Grating
  - b. Absorption filter
  - c. Interfere filter
  - d. Prism

Q.2 Answer in very short (Any Ten) 20

1. Which polymeric materials are used in SDS-PAGE? Discuss the mechanism of polymerization reaction for polyacrylamide gel.

①

(P.T.O.)

2. Name electrophoretic method used for separation of DNA with different size. Write down the principle of it.
3. How separating gel is different with stacking gel of SDS-PAGE in its composition?
4. Derive the equation of RCF.
5. Define hyperchromatic and bathochromatic shift?
6. Write down the difference between colorimeter and spectrophotometer?
7. What is monochromator? Discuss the monochromators for U. V. Region.
8. List various detector used in GLC. Explain the working principle of ECD.
9. Give the application of gel filtration chromatography.
10. Explain the basics of swinging bucket rotor.
11. Define partition coefficient. Write down the basic principle of adsorption chromatography.
12. Discuss various gradient materials used in the centrifugation techniques.

- Q.3 a) List various component of U.V. spectrophotometer. Explain the working principle and application of UV spectrophotometer [5]  
 b) Give an account on: Type of monochromators [5]

**OR**

- Q.3 a) Discuss the working procedure of IR in brief. [5]  
 b) Write down the beer's law. Explain the functioning of different components of colorimeter. [5]

- Q.4 a) Write down the basic principle of centrifugation. Discuss various factors affecting speed of centrifuge. [5]  
 b) Give an account on: Isolation of DNA by centrifuge [5]

**OR**

- Q.4 a) Write down the working principle of Ultracentrifugation along with diagram. [5]  
 b) Explain Isophynic centrifugation techniques. How it differ with rate zonal rotor? [5]

- Q.5 a) What are exchangers? Write down the process and application of Ion exchange chromatography. [5]  
 b) Discuss the various component of HPLC in detail. Why HPLC give better resolution than TLC. [5]

**OR**

- Q.5 a) Give an account on : Principle and procedure of Molecular exclusion chromatography [5]  
 b) Explain the various column and detectors used in gas chromatography [5]

- Q.6 Describe the principle and procedure of SDS- PAGE for protein separation along with different staining method. [10]

**OR**

- Q.6 Discuss DNA agarose gel electrophoresis in detail. [10]