

B.Sc. MICROBIOLOGY
FIFTH SEMESTER [SPECIAL REPEAT]
INSTRUMENTATION & BIOTECHNIQUES
BMB-504

SET
A

Duration: 3 hrs.

Full Marks: 70

(Objective)

Time: 30 mins.

Marks: 20

Choose the correct answer from the following:

1 × 20 = 20

- Pure water is known to be which of the following?
 - Strong electrolyte
 - Good conductor of electricity
 - Non-electrolyte
 - Acidic
- Which of the following is not a failure in pH meters?
 - Defective electrodes
 - Defective input circuitry
 - Defective electronic circuitry
 - Defective calibration
- Which of the following reference electrodes are used as internal and external reference electrodes in combination electrodes?
 - Silver/silver chloride electrode
 - Calomel electrode
 - Mercury/mercury sulphate electrode
 - Mercury/mercury chloride electrode
- Which one of the following is an example of adsorption?
 - Ammonia in contact with water
 - Anhydrous CaCl₂ with water
 - Silica gel in contact with water vapours
 - All of the above
- In Thin Layer Chromatography, the sample is:
 - In contact with mobile phase
 - Not in contact with mobile phase
 - Coated at the level of mobile phase
 - Coated below the level of mobile phase
- Isotopes of an element have a different number of:
 - Neutron
 - Proton
 - Electron
 - Negatron
- Helium nuclei particles are called:
 - Alpha particles
 - Beta particles
 - Gamma particles
 - Delta particles
- 1 Ci is equal to..... disintegrations per second.
 - 3.7×10^{10}
 - 2.7×10^{10}
 - 1.7×10^{10}
 - 3.9×10^{10}
- The use of insulin hormone to purify its receptor is an example of:
 - Gel filtration chromatography
 - Affinity chromatography
 - Size exclusion chromatography
 - Ligand chromatography
- A 1mCi source of ³²P gives a dose of 10 mSv h⁻¹ at 1 cm. What will be the dose rate at 5 cm?
 - 0.5 mSv h⁻¹
 - 0.4 mSv h⁻¹
 - 1.0 mSv h⁻¹
 - 0.8 mSv h⁻¹

11. The Unit of molar extinction co-efficient:
 a. L/mol/cm
 c. g/mol/cm
 b. L/g/cm
 d. L/cm/mol
12. Radio immune assay was developed by:
 a. Vector & Logan
 c. Chals & Wastone
 b. Berson & Yalow
 d. Lewis & Bronstand
13. Movement of biomolecules depends on:
 a. The rate of migration is directly proportional to current
 c. The rate of migration is directly proportional to the resistance of the medium
 b. The rate of migration is inversely proportional to current
 d. Low voltage is used for separation of high molecular weight compounds
14. Protein separation is done through:
 a. PFGE
 c. Agarose gel electrophoresis
 b. PAGE
 d. None of the above
15. Ring-shaped precipitation band is formed in:
 a. Ouchterlony Procedure
 c. Oakley-Fulthrope Procedure
 b. Mancini technique
 d. Oudin Procedure
16. First Mass spectrometer was constructed by:
 a. Luwenhoek
 c. Edward Jenner
 b. J.J. Thompson
 d. Galileo
17. The force related to magnetic field is:
 a. Columbic force
 c. Electric force
 b. Lorentz force
 d. Momentum
18. Isoelectric focusing is related to:
 a. 1D electrophoresis
 c. 2D electrophoresis
 b. Mass spectroscopy
 d. Immunoelectrophoresis
19. Ouchterlony Procedure follows:
 a. Double diffusion in Two Dimension
 c. Single diffusion
 b. Double diffusion in one Dimension
 d. None of the above
20. ELISA allows for rapid screening and quantification of the presence of..... in a sample.
 a. Amino acid
 c. Protein
 b. DNA
 d. Antigen

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(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

[Answer question no.1 & any four (4) from the rest]

1. Define Beer-Lambert's law. Derive the expression for molar extinction co-efficient. 10
2. Describe briefly the principle of mass spectroscopy with neat labelled diagram. List out few applications. 8+2=10
3. Explain the two types of density gradient centrifugation with diagrams. 10
4. Explain the working principle of a pH meter with a diagram. 10
5. Explain ion exchange chromatography with a labelled diagram. 10
6. a) Write a note on Applications of UV visible spectroscopy. 5+5=10
b) A light is passed through a 1 mm path length cell containing 0.005 moles/dm³ solution. The light intensity is reduced to 16% of its value. Calculate the molar extinction coefficient of the sample. What would be the transmittance if the cell path is 2mm?
7. Explain the two methods to measure radioactivity with proper diagrams. 10
8. Write short notes on: 5+5=10
 - a) 2D gel electrophoresis
 - b) Ouchterlony Procedure

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