

**M.Sc. MICROBIOLOGY
FIRST SEMESTER (REPEAT)
BIOINSTRUMENTATION
MMB-102**

**SET
A**

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs.

Full Marks: 70

Time: 30 mins.

Marks: 20

(Objective)

Choose the correct answer from the following:

1 × 20 = 20

- Which of the following technique uses sound waves for cell disruption?
 - Homogenization
 - Blender
 - Sonication
 - Mortar and Pestle
- Gas chromatography can be performed in which of the following ways?
 - Only in columns
 - Only on plane surfaces
 - Either in columns or in plane surfaces
 - Neither in columns or in plane surfaces
- Three types of radioactive elements are emitted when unstable nuclei undergo radioactive decay. Which of the following is not one of them?
 - Alpha
 - Delta
 - Gamma
 - Beta
- In electrophoresis, DNA will migrate towards:
 - Cathode
 - Anode
 - Both a and b
 - None of them
- In thin-layer chromatography, the stationary phase is made ofand the mobile phase is made of.....
 - Solid, liquid
 - Liquid, liquid
 - Liquid, gas
 - Solid, gas
- What is the wavelength range of the UV spectrum?
 - 100 nm to 500 nm
 - 200 nm to 800 nm
 - 300 nm to 1000 nm
 - 400 nm to 1600 nm
- Which statement is true for all three types of radioactive emission?
 - They are deflected by electric fields
 - They ionise gases
 - They emit light
 - They are completely absorbed by a thin aluminium sheet
- In a chromatogram, the area under the peak can be used to determine which of the following?
 - Components of the sample
 - Amount of components in the sample
 - Column efficiency
 - Column resolution
- Isotopes of an element have a different number of:
 - Proton
 - Electron
 - Neutron
 - Atom

10. In thin layer chromatography, the sample is:
- In contact with the mobile phase
 - Not in contact with the mobile phase
 - Coated at the level of mobile phase
 - Coated below the level of mobile phase
11. Chromatography is a physical method that is used to separate and analyse:
- Simple mixtures
 - Complex mixtures
 - Viscous mixtures
 - Metals
12. The technique of electrophoresis, for the separation of charged molecules was developed by:
- Tswett
 - Svedberg
 - Tisekius
 - Sanger
13. In chromatography, the stationary phase can besupported on a solid.
- Solid or liquid
 - Liquid or gas
 - Solid only
 - Gas only
14. What does the electrophoresis apparatus consist of?
- Gel, buffer chamber and fire pack
 - Buffer chamber and electrophoresis unit
 - Electrophoresis unit and gel separator
 - Power pack and electrophoresis unit
15. Which of the following is not the product of cell disruption?
- DNA
 - RNA
 - Water
 - Protein
16. In chromatography, which of the following can the mobile phase be made of?
- Solid or liquid
 - Liquid or gas
 - Gas only
 - Liquid only
17. Which of the following is NOT a method of cell disruption?
- Sonication
 - Homogenization
 - Streaking
 - Chemical Treatment
18. Which technique separates charged particle using electric field?
- Hydrolysis
 - Electrophoresis
 - Protein synthesis
 - Protein denaturing
19.is used for bacterial cell disruption.
- Water
 - Lysozyme
 - Both
 - None
20. Thin-layer chromatography is:
- Partition chromatography
 - Electrical mobility of ionic species
 - Adsorption chromatography
 - None of the above

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(Descriptive)

Time : 2 hr. 30 mins.

Marks : 50

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

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| 1. What is Chromatography? What is the basic principle of Chromatography? | 10 |
| 2. What is centrifugation? Write a note on the different types of centrifuges available based on the maximum speed attainable. | 3+7=10 |
| 3. Differentiate:
a) Agarose gel electrophoresis and PAGE
b) Simple microscope and compound microscope | 2×5=10 |
| 4. Define:
a) Mobile phase
b) Stationary phase
c) Eluent
d) Chromatogram | 2.5×4=10 |
| 5. What is Cell Disruption? Explain the various methods for Cell Disruption. | 10 |
| 6. Describe the instrumentation of the UV-VIS spectrophotometer. | 10 |
| 7. Describe the principle of Paper chromatography. Write a note on its applications. | 10 |
| 8. What is agarose gel electrophoresis? What are the factors affecting the rate of migration of molecules? | 10 |

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