

M.Sc. (Envi.) Semester - 2 (CBCS) Examination**March/April - 2024****Instrumentation and Analytical Technique (Core)****Time: 02:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

Q.1 Answer the following (any seven out of ten, each of **two marks) (14)**

1. Explain the Jablonski diagram.
2. Explain application phase contrast microscopy?
3. What is mass to charge ratio?
4. Explain the beer and lambert law.
5. Explain the function of EtBr.
6. Who discover the electron microscopy?
7. Explain the affinity chromatography in brief.
8. Define the role of microtome in microscopy.
9. Differentiate between UV and IR spectroscopy regarding the type of molecular information they provide and their applications in chemical analysis.
10. What are the key differences between Transmission Electron Microscopy (TEM) and Scanning Electron Microscopy (SEM) regarding their imaging mechanisms and sample preparation techniques?

Q.2 Answer the following (any two out of three, each of **seven marks) (14)**

1. Describe phase contrast microscopy in detail.
2. Write a note on scanning electron microscopy.
3. Explain principle and sample preparation and of fluorescence microscopy.

Q.3 Answer the following questions.

1. Describe gel permeation chromatography. (05)
2. Explain the principal of TLC. (05)
3. Describe the Affinity chromatograph with its application. (04)

OR

Q.3 Answer the following questions.

1. Discuss the principle and application of GC-MS. (07)
2. Explain HPLC in detail. (07)

Q.4(A) Answer the following (any two) (10)

1. Describe the Vibrational spectroscopy.
2. Describe atomic absorption spectroscopy.
3. Explain Basic principal colorimeter.

Q.4(B) Answer the following (any one) (04)

1. Explain UV-vis spectroscopy.
2. Write a note on Flame photometry.

Q.5 Answer the following (any two out of three, each of **seven marks) (14)**

1. Explain principle, and applications of centrifugations.
2. Discuss the basic principle and application of 2D-PAGE.
3. Discuss Agarose electrophoresis techniques and its application.
4. Write a note on Isoelectric Focusing.
