Q.P. Code :08315

[Time: 2½ Hours] **[Marks:60]**

Please check whether you have got the right question paper.

N.B: 1. **All** questions are **compulsory**.
2. **Figures** to the **right** indicate **marks assigned to the question.**

1. Answer Any two of the following: 12

(a) State the principle underlying and schematically explain the working of an IR spectrophotometer.
(b) Write an account on the detection devices used UV-Visible spectrophotometers.
(c) Explain the principle underlying and describe the specialized atomization techniques used in atomic absorbtion spectroscopy.
(d) Write a short note on the applications of UV-Visible spectrophotometry.

2. Answer Any two of the following: 12

(a) Write a short note on chromatographic columns and stationary phases used in GLC.
(b) Discuss any four detectors in detail used in HPLC.
(c) Explain with the help of diagram instrumentation in supercritical fluid extraction.
(d) Write a short note on supercritical fluid selection and applications of supercritical fluid chromatography.

3. Answer Any two of the following: 12

(a) What is FISH? Write an account of its applications in localization of macromolecules and cell organelles.
(b) Write a note on various methods of DNA microarray fabrication.
(c) Given an account of the precautions essential during PCR primer design.
(d) Discuss fabrication and applications of microsensors.

4. Answer Any two of the following: 12

(a) Explain in detail the significance of cantilever in MFM.
(b) Compare and Contrast between SEM and TEM.
(c) Schematically explain X ray diffactometer and given the role of each part.
(d) Write a note on Auger Electron Spectroscopy.

5. Do as directed. 12

(a) Given two examples of (any 4)

i. Elements that cannot be analysed by AAS.
ii. Ways of recording solid spectra in IR spectrophotometry.
iii. Adsorbents used in columns of Gas Solid Chromatography.
iv. Column packings in HPLC.
v. Sources of photons in photoluminescence spectrophotometer.
vi. Scanning probe microscopes.
vii. Cell sorting methods by flow cytometry.
viii. Modified PCR in diversity studies.

(b) Define (any 4)

i. Difference spectroscopy.
ii. Electrothermal atomizers.
iii. Sample derivatization.
iv. Extra Column Broadening.
v. Atomic scattering factor.
vi. X ray photoelectron spectroscopy.
vii. In situ synthesized DNA microarray.
viii. Hot start PCR.

(c) Give significance/role of (any 2)

i. Nernst Glower.
ii. Carrier gas in Gas Chromatography.
iii. Scanning near filed optical microscope.
iv. Nested primers in PCR.
