Q.P. Code: 34858

Duration: 3 Hours   Total marks 70

N.B.:

    i.   All questions are compulsory
    ii.   Figures to the right indicate full marks
    iii.   Draw neat labeled diagram wherever necessary.
    iv.   Answer all sub questions together

Q1. (a) Answer the following (any seven)   **7**

    i.   Explain the term Auxochrome

    ii.   Enlist sources of radiation used in IR spectrophotometer.

    iii.   Write any two basic units for radioactivity.

    iv.   Define Hyper chromic shift.

    v.   Name any two types of burners used in Flame Photometry.

    vi.   Give equation for calculating the statistic 'Q' for rejection of results.

    vii.   Why do you need two Monochromators in Fluorimeter?

    viii. Write IR absorption frequency of Ester group.

(b) Answer the following (any four)   **8**

    i.   Write two important points of differentiation between fluorescence and phosphorescence

    ii.   Write details about anionic interferences in flame photometry.

    iii.   What is criteria to choose solvent for UV analysis of any organic compound?

    iv.   Comment on choice of fluorimeter over UV-Visible spectrophotometer with respect to sensitivity and specificity.

    v.   What is radiochemical purity? Give one example of radiochemical impurity. Name analytical method used to determine same.

Q2. (a) Answer the following (any two)   **8**

    i.   Discuss the basic modes of interaction of molecules with IR radiation
    ii.   What is Raman spectra? Write two advantages of Raman Spectroscopy over Infra-red spectroscopy
    iii.   What is quenching? Discuss any three factors which affect fluorescence intensity.

    (b) Specific absorbance of a Paracetamol at its λmax. is 1100. 1ml of an injection containing   **3**
the   Paracetamol, when diluted to 1 liter for an analysis, gave an absorbance of 0.87 at λmax when measured in 2cm cell. Calculate the amount of Paracetamol in mg/ml of the injection.

Q3. (a) Answer the following (any two)   **8**

i. Write a note on Hollow cathode lamp used in Atomic absorption spectroscopy.

ii. Give principle involved and any two pharmaceutical applications of Differential Scanning Calorimetry (DSC).

iii. Enlist four methods used for determining the concentration of UV absorbing substance and discuss any one in detail.

(b) Discuss construction and working of any one detector used in IR spectroscopy.   **3**

Q4. (a) Answer the following (any two)   **8**

i. State Beer-Lamberts law and derive its equation.

ii. Write a note on factors affecting Thermogravimetric (TG) curve.

iii. Ciprofloxacin may be determined by measuring the absorbance in ethanol solution. Standard ethanolic solutions of Ciprofloxacin gave the following absorbance values. Calculate the correlation coefficient r, slope and intercept.

Conc. of Cipro [ppm]	0.00	0.20	0.40	0.60	0.80
Absorbance	0.00	0.24	0.43	0.70	0.97

(b) The standard deviation from one set of 12 determinations was 0.320 and the standard deviation from another 9 determinations was 0.547. Is there any significant difference between the variences Of these two sets of results? (tabulated F-value is 2.95)   **3**

Q5. (a) Answer the following (any two)   **8**

i. Draw a neat labeled diagram of double beam UV Visible spectrophotometer and explain its working.

ii. Name two sources of radiation used in Fluorimeter. With reference to fluorimetry explain terms wavelength of excitation and wavelength of emission.

iii. Discuss the various possible electronic transitions that occur in any organic compound after absorption of UV Visible electromagnetic radiation.

(b) Discuss principle involved in X-ray diffraction technique. Give the equation to study diffraction pattern for polycrystalline material   **3**

Q6. (a) Answer the following (any two)   **8**

i. Write a short note on FT-IR spectroscopy.

ii. Write details about isotope dilution analysis in radiochemistry.

iii. Explain the term "Scanning of a compound" in UV Visible region and why wavelength maxima is chosen for analysis of a compound.

(b) Give three points of difference between prism and grating monochramator.   **3**