2016 -2017 - Re-Exam SBm-VI (~~pt-Bom~~)
Second half 2016
PA -II

Q.P. Code : 500200

(3 Hours) [Total Marks : 70

N.B. : (1) **All** questions are **compulsory**.
(2) **Figures** to the **right** indicate **full marks**.
(3) **Draw** neat **labelled diagram** wherever **necessary**.

1. (a) Answer the following (**Any Seven**) : 7
   (1) Write IR frequency of hydroxyl group.
   (2) What is cut off wavelength?
   (3) Name any two flameless atomization techniques in Atomic spectroscopy.
   (4) Define the term sievert in radiochemistry.
   (5) Convert wavelength of 1000 μm (micrometer) to wavenumber (per cm).
   (6) Name two IR transparent materials.
   (7) Name one derivatizing agent used to convert non-fluorescent compound to fluorescent one.
   (8) What are degrees of freedom in statistical analysis.

   (b) Explain the terms (**Any Four**) : 8
   (1) Transmittance
   (2) Overtones
   (3) Triplet State
   (4) Cationic Interference
   (5) Bathochromic Shift

2. (a) Answer the following (**Any Two**) : 8
   (1) With the help of suitable diagram, explain various types of scattering studied in Raman Spectroscopy.
   (2) Enlist four wavelength selectors used in UV-visible spectroscopy. Explain any one in detail.
   (3) Discuss the term attenuated total reflectance with the help of suitable diagram.

   (b) A solution of drug X gave an absorbance of 0.982 at the λ_{max} of 230nm in a 1cm path length cell. Find the concentration of drug in mg/ml in the solution if molar absorptivity of drug X at 230nm is 3512 and its molecular weight is 256. 3

TURN OVER

1

3. (a) Answer the following (**Any Two**) :   8
   (1) Give principle involved and any two pharmaceutical applications of differential scanning calorimetry.
   (2) With the help of suitable diagram, explain construction and working of hollow cathode lamp.
   (3) Discuss UV spectrophotometric method for determination of rate constant of a reaction.

   (b) Discuss basic modes of vibrations of molecular bonds.   3

4. (a) Answer the following (**Any Two**) :   8
   (1) State and derive Beer Lambert's Law.
   (2) In spectrophotometric assay of drug Y, working standard solutions gave following absorbance values.

Concentration (µg/ml)	Absorbance at 257nm
2	0.15
4	0.29
6	0.44
8	0.62
10	0.77

Perform linear regression to determine slope and intercept of calibration line produced with the above data.

TURN OVER

(3) The following data was obtained for content of drug in a tablet formulation.

Sr. No.	Weight (mg)
1	100.3
2	100.7
3	99.9
4	100.5
5	100.1
6	100.2
7	103.1
8	101.3
9	98.9
10	100.5

Use 't' test to check whether the true mean content of drug is 101.9 mg at 5% significance.

Tabulated 't' value for 9 degrees of freedom is 2.26.

(b) Enlist factors affecting Thermo gravimetric curve.   3

5. (a) Answer the following (Any Two) :   8
    (1) Explain single and double point standardization method for quantitative spectrophotometric assay of a single component formulation.
    (2) Explain any four factors which affect fluorescence of a compound.
    (3) Discuss various types of electronic transitions seen in UV visible spectroscopy.

(b) Write Bragg's Law. Enlist any two applications of X-ray diffraction.   3

TURN OVER