Pharm / sem-VI (CBSGS) 11/05/2016

PA-II

Q.P. Code : 500202

(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 Five**) : **10**
   (1) Write four differences between atomic spectroscopy and molecular spectroscopy.
   (2) What is the meaning of absorption spectrum and λ_{max}?
   (3) What is bathochromic shift? What are the reasons for occurrence of bathochromic shift?
   (4) Explain the terms radioactivity and half life of ratio isotopes.
   (5) What is finger point region in IR spectrum. Give an application of the same.
   (6) What is static and dynamic quenching of fluorescence?

   (b) Explain the terms (**Any Five**) : **5**
   (1) Miller's indices
   (2) Correlation coefficient
   (3) Quantum yield
   (4) Becquerel
   (5) Radionucleidic purity
   (6) Internal conversion in fluorescence

2. (a) Answer the following (**Any Two**) : **8**
   (1) Name any two detectors used in UV visible spectroscopy and IR spectroscopy. Describe any one in detail.
   (2) With the help of a diagram, explain the theory of Raman spectroscopy.
   (3) Draw a schematic diagram of a photofluorimeter and explain its working.

   (b) A 15 µg/ml aqueous solution of a drug X (Mol. wt. 157) placed in a 1cm cell, gives an absorbance of 0.56 at 250nm. Calculate the specific absorbance and molar absorptivity at 250nm. **3**

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3. (a) Answer the following (**Any Two**) : 8

(1) Give any four points of comparison between atomic absorption spectroscopy & atomic emission spectroscopy. Draw a neat labelled diagram of a flame photometer.

(2) With the help of a diagram describe the instrument used for Differential Thermal Analysis.

(3) Give approximate wavenumbers of fundamental absorption bands for following vibrations.

- O - H stretch in phenols.
- $>C = O$ stretch in carbonyl compounds.
- C - H stretch in aryl group.
- $-C \equiv N$ stretch in nitriles

(b) Elaborate any three factors affecting molecular bond vibration frequency. 3

4. (a) Answer the following (**Any Two**) : 8

(1) What is Beer Lambert's Law? Derive it. Enlist any four measures taken to ensure that Beer Lambert's Law is followed.

(2) When drug content in a tablet formulation was determined in six replicates, following results were obtained.
501.5, 500.1, 498.7, 497.0, 502.0, 502.4.
Generate a 95% confidence internal about the mean if the relevant t-value for 5 degrees of freedom is 2.57.

(3) In a titrimetric assay, burette readings obtained on day 1 were 25.2, 25.5, 25.4, 25.5 and 25.3 ml day 2 the burette readings were 25.3, 25.5, 26.4, 25.0 ml. Was the variance on day1 significantly different from day 2 at 5% [tabulated F value is 6.59].

(b) Explain the theory involved in thermogravimetric analysis. Exemplify your answer with a TG curve. 3

5. (a) Answer the following (**Any Two**) : **8**
   (1) Enlist different methods for determination of concentration of a single component using UV visible spectroscopy. Discuss any one in detail.
   (2) Give an account of factors influencing fluorescence intensity.
   (3) Describe the construction and working of Geiger Muller counter.

   (b) Derive Bragg's equation for x-ray diffraction. **3**

6. (a) Answer the following (**Any Two**) : **8**
   (1) With the help of suitable diagram, explain construction and working of FTIR spectrophotometer.
   (2) Write a note on 99m Tc radionuclide generator.
   (3) Using an energy level diagram depict electronic transitions in UV visible spectroscopy. Draw a neat labelled schematic diagram of a UV visible spectrophotometer.

   (b) Explain with example how chemical derivatization is used in UV visible spectroscopy and fluorimetry. **3**

Course: **T.Y. Bachelor of Pharmacy (Sem VI) (CBSGS)(Prog-T10026)**

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Correction:

Q.1 a) (4) Read As **Radio** instead of **Ratio**

Q.1 a) (5) Read as **Print** instead of **point**

Q.2 a) (1) Describe any one Detector either of UV or IR

Q.4 a) (2) Read As **Interval** instead of **Internal**

Date and Time 11/05/2016 03:58 PM