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2021

B.Pharm. 7th Semester (Repeater) Examination

Pharmacy

PHARMACEUTICAL ANALYSIS - III

(Old Regulation)

Full Marks - 100

Time - Three hours

The figures in the margin indicate full marks for the questions.

Answer question No. 1 and any six from the rest.

I. Answer the following: (10 × 1 = 10)

1. (i) The shifting of an absorption to lower energy is called _____.
(a) Red shift (b) Blue shift
(c) Hypochromic shift (d) Hyperchromic shift
- (ii) Which compound is used as diluent in IR sampling?
(a) Alkyl halide (b) Baking soda
(c) Plaster of Paris (d) Washing soda
- (iii) Nujol oil is a _____
(a) Mineral oil (b) Polymer
(c) Volatile oil (d) All of the above
- (iv) Following is the source of light used in fluorimeter:
(a) H₂/D₂ lamp (b) Xenon arc
(c) Tungsten (d) Nernst glower
- (v) Intersystem crossing mainly results into _____
(a) Phosphorescence (b) Fluorescence
(c) Quenching (d) Relaxation

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- (vi) Anode in AAS consists of:
- Tungsten wire
 - Platinum wire
 - Xenon arc
 - Based on the element to be detected
- (vii) The reference compound used in NMR is:
- TMS
 - Sodium oxalate
 - Sodium perchlorate
 - Both (b) and (c)
- (viii) M+1 peak occurs for which type of isotopes:
- ^{18}C
 - ^{34}S
 - ^{13}C
 - ^{81}Br
- (ix) Derivatization techniques in HPLC are intended to enhance:
- Molecular weight
 - Detectability
 - Reproducibility
 - Reversibility
- (x) In isocratic system of HPLC mobile phase _____.
- Changes time to time
 - Remains constant
 - Both of the above
 - None of the above

- II. Long type questions: (6 × 15 = 90)
- Write the principle involved in UV. Explain the various electronic transitions involved. Derive Beer-Lambert's law. (5+5+5 = 15)
 - Write a note on effect of substituents on the absorption spectra in UV-Vis spectroscopy. Discuss photo multiplier tube with schematic diagram. Calculate the λ_{max} of naphthalene using Woodward Projection formula. (5+5+5 = 15)
 - What are the various bending vibrations associated in IR spectroscopy? Discuss the factors affecting vibrational frequency. (5 + 10 = 15)
 - Write a note on sources of light and detectors used in IR spectroscopy. Explain Fermi resonance with some examples. Draw a schematic diagram of bolometer and discuss its working. (5+5+5 = 15)
 - Distinguish between fluorescence and phosphorescence. Explain the factors affecting fluorescence and phosphorescence. (5+10 = 15)
 - Explain Jablonski's diagram. What are the different types of quenching? (10+5 = 15)

5. (a) Discuss the working and instrumentation of flame photometer. Write the various fuels and oxidants along with the temperature generated in flame photometer. (10+5 = 15)
- (b) Write the principle of AAS. Discuss the components of AAS. (5+10=15)
6. (a) Explain the shielding effect and de-shielding effect in NMR spectroscopy. Write the principle involved in NMR. Discuss chemical shift. (5+5+5 = 15)
- (b) Give block diagram of experiment of the experiment setup of NMR. Discuss spin-spin coupling. (5+5+5 = 15)
7. (a) Discuss the instrumentation of HPLC. Write the principle involved in HPLC. (10+5 = 15)
- (b) Write a note on mass spectrometry. Elaborate the different types of peaks observed in mass spectrometry. (5+10 = 15)
8. Write the principle and technique of radio immune assay (RIA). Discuss the requirements of RIA. (5+10 = 15)
9. Discuss X-ray diffraction (XRD). Derive Bragg's law. Write the applications of XRD. (5+5+5 = 15)
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