BP701T: Instrumental Methods of Analysis (Theory)

MCQ Assessments

Unit I: UV-Visible Spectroscopy, Fluorimetry

1. What does Beer's Law relate to in UV-Visible spectroscopy?
   a) Emission intensity
   b) Absorbance, concentration, and path length
   c) Fluorescence quenching
   d) Wavelength selection

2. Which group is a chromophore in UV-Visible spectroscopy?
   a) –OH
   b) C=O
   c) –CH3
   d) –NH2

3. What is the primary light source for UV spectroscopy?
   a) Tungsten lamp
   b) Deuterium lamp
   c) Xenon lamp
   d) Mercury lamp

4. What is a hypsochromic shift?
   a) Shift to longer wavelength
   b) Shift to shorter wavelength
   c) Increase in absorption intensity
   d) No change in wavelength

5. What reduces fluorescence intensity in fluorimetry?
   a) Quenching
   b) Increasing temperature
   c) Using a polar solvent
   d) All of the above

6. Which component selects specific wavelengths in a UV-Visible spectrophotometer?
   a) Detector
   b) Monochromator
   c) Light source
   d) Sample cell

7. Which electronic transition is common in saturated compounds?
   a) $\pi \rightarrow \pi^*$
   b) $n \rightarrow \pi^*$
   c) $\sigma \rightarrow \sigma^*$
   d) $n \rightarrow \sigma^*$

8. What is an application of fluorimetry in pharmaceuticals?
   a) Measuring molecular size
   b) Quantifying fluorescent drugs
   c) Identifying functional groups
   d) Separating ions

9. What is the role of a photomultiplier tube in UV-Visible spectroscopy?
   a) Emits light
   b) Detects light intensity
   c) Selects wavelengths
   d) Holds the sample

10. Which factor affects fluorescence intensity?
   a) Sample color
   b) Presence of quenchers
   c) Path length
   d) Detector type

Answer Key for Unit I MCQ
1. b) Absorbance, concentration, and path length (Remembering)
2. b) C=O (Remembering)
3. b) Deuterium lamp (Remembering)
4. b) Shift to shorter wavelength (Understanding)
5. d) All of the above (Understanding)
6. b) Monochromator (Remembering)
7. c) $\sigma \rightarrow \sigma^*$ (Understanding)
8. b) Quantifying fluorescent drugs (Applying)
9. b) Detects light intensity (Understanding)
10. b) Presence of quenchers (Applying)