

**B.Sc. (P) Physical Science with Chemistry Sem III Class test (2023-2024)**  
**DSE: Polynuclear Hydrocarbons, Pharmaceutical Compounds, UV-Vis and IR Spectroscopy**

Maximum Marks = 16

Time = 1 h

Teacher: Dr. Shilpa Jain

**Q1. The U.V Spectrum of acetone shows the peaks at (3)**

- (i)  $\lambda_{\max} = 280 \text{ nm}$ ,  $\epsilon_{\max} = 15$
- (ii)  $\lambda_{\max} = 190 \text{ nm}$ ,  $\epsilon_{\max} = 100$

From the data given above identify:

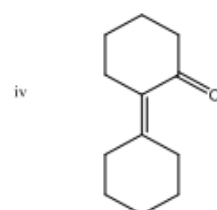
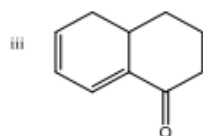
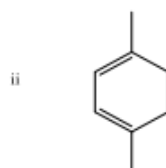
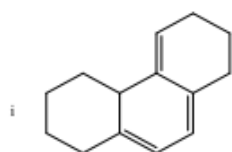
- (i) The electronic transition for each.
- (ii) Which is more intense and why?

**Q2. Define the term bathochromic shift and what structural feature may produce a bathochromic shift.(2)**

Or

Increase in polarity of the solvent shifts  $\pi$ -  $\pi^*$  band to longer wavelength but  $n$ -  $\pi^*$  to short wavelength.” Comment on the statement. (2)

**Q3. Calculate the  $\lambda_{\max}$  of the following compounds using Woodward-Fieser rules (10)**



Use the following data for calculation:

- i) Parent Six membered ring ketone = 215 nm
- ii) Parent acyclic diene = 217 nm
- iii) Parent Heteroannular diene = 214 nm
- iv) Parent Homoannular diene = 253 nm

**Q4. What are Auxochromes and Chromophores? Using suitable examples explain how they affect UV spectra of an organic molecule?**