

MULTIPLE CHOICE QUESTIONS

1. The energy required for various transitions follow the order:

- (a) $\sigma \rightarrow \sigma^* > n \rightarrow \sigma^* > \pi \rightarrow \pi^* > n \rightarrow \pi^*$
 (b) $\sigma \rightarrow \sigma^* > \pi \rightarrow \pi^* > n \rightarrow \sigma^* > n \rightarrow \pi^*$
 (c) $\pi \rightarrow \pi^* > n \rightarrow \pi^* > \sigma \rightarrow \sigma^* > n \rightarrow \sigma^*$
 (d) $n \rightarrow \pi^* > \sigma \rightarrow \sigma^* > n \rightarrow \sigma^* > \pi \rightarrow \pi^*$

2. Hydrogen bonding in organic compounds shifts the ultraviolet absorptions to:

- (a) shorter frequencies
 (b) shorter wavelength
 (c) remain unchanged
 (d) none of these

3. The value of extinction coefficient increases with

- (a) increase in conjugation
 (b) addition of chromophore
 (c) both of these

4. An auxochrome is one which is

- (a) colour enhancing
 (b) a group or atom with lone pairs of electrons
 (c) extending conjugation
 (d) all of these

5. In a carbonyl compound (aldehyde or ketone)

- (a) $n \rightarrow \pi^*$ transition is less intense
 (b) $\pi \rightarrow \pi^*$ transition is less intense
 (c) $n \rightarrow \pi^*$ transition is more intense
 (d) None is correct

6. In a carbonyl compound, the increase in polarity of a solvent shifts the following transitions to shorter wavelength

- (a) $n \rightarrow \pi^*$ (b) $\pi \rightarrow \pi^*$ (c) $n \rightarrow \sigma^*$ (d) $\sigma \rightarrow \sigma^*$

7. In conjugated dienes, the $\pi \rightarrow \pi^*$ transition occurs at longer wavelength. The reason is that as the conjugation extends, the distance between HOMO and LUMO:

- (a) decreases
 (b) increases
 (c) first increases and then decreases
 (d) not certain

8. Certain alkenes show cis-trans Isomerism. For example, cis and trans cinnamic acid show absorptions in UV radiation. Out of these, cis-isomer absorbs at _____ and transition is _____.

- (a) lower wavelength than trans
 (b) higher wavelength than trans
 (c) $\pi \rightarrow \pi^*$
 (d) $n \rightarrow \pi^*$

9. Ultra violet spectroscopy is useful for the detection of _____

- (a) functional group
 (b) extent of conjugation
 (c) geometrical isomers
 (d) all of these

10. The effect of the ultraviolet radiation on organic compound is to cause

- (a) bond vibrations in the molecule
 (b) rotation in the molecule
 (c) electronic transitions
 (d) all of these

11. When a few drops of an acid is added to arylamine, absorption occurs at lower wave length. The reason is:
- (a) increase in conjugation (b) reduction in conjugation
(c) acid decomposes the compound (d) compound remains insoluble
12. The structural increment of 5 nm for estimating λ_{max} for α, β -unsaturated carbonyl compound is given for:
- (a) exocyclic double bond (b) alkyl substituent
(c) ring residue (d) all of these
13. Applying woodward Fieser rules, the basic value of 215 nm is given to:
- (a) acyclic ketone (b) six membered cyclic ketone
(c) α, β -unsaturated aldehyde (d) α, β -unsaturated ester
14. While studying keto-enol tautomerism, the extinction coefficient is much higher for:
- (a) ketonic form (b) enolic form (c) not sure.
15. o-Nitroacetanilide is deep yellow whereas para-nitroacetanilide is yellow. The reason is:
- (a) ortho-shows intramolecular hydrogen bonding
(b) intramolecular hydrogen bonding stabilises the excited state
(c) excitation energy required for other isomer is smaller.
(d) all of these.

(a) all of these.

ANSWERS. 1. (a) 2. (b) 3. (c) 4. (d) 5. (a) 6. (a) (c) 7. (a) 8. (a, c) 9. (a)
10. (c) 11. (b) 12. (d) 13. (a, b) 14. (b) 15. (d)