

Roll No. 

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 02

Total No. of Questions : 08

M.Sc. (Ph. Chem) (2018 Batch) (Sem.-1)

**SPECTRAL TECHNIQUES**

Subject Code : MSPC-105

M.Code : 20503

Time : 3 Hrs.

Max. Marks : 80

**INSTRUCTIONS TO CANDIDATES :**

1. Attempt any FIVE questions out of EIGHT questions.
2. Each question carries SIXTEEN marks.

1. a) Describe the various types of electronic transitions observed in organic compounds when exposed to UV & visible lights.  
b) Explain various factors affecting wavelength maxima with example.
2. a) Explain the principle of I.R. Spectroscopy.  
b) Explain dispersive spectrophotometer.
3. a) How can you distinguish between the following pairs of structures on the basis of PMR spectroscopy :-
  - a.  $\text{CH}_2\text{Br}-\text{CH}_2\text{Br}$  &  $\text{CH}_3-\text{CHBr}$
  - b.  $\text{CH}_3\text{CH}_2\text{OH}$  &  $\text{CH}_3-\text{O}-\text{CH}_3$
  - c.  $\text{CH}_3-\text{C}_6\text{H}_5-\text{CH}_3$  &  $\text{C}_6\text{H}_5-\text{CH}_2-\text{CH}_3$
  - d.  $\text{CH}_3\text{CH}_2\text{CHO}$  &  $\text{CH}_3-\text{CO}-\text{CH}_3$  
b) Explain Spin-Spin coupling and cause of splitting.
4. a) Explain Nitrogen Rule.  
b) Explain different types of Mass Spectroscopy.
5. a) Explain Pharmaceutical application of mass spectroscopy.  
b) Explain HOMCOR & HETCOR.

6.
  - a) Explain the application of U.V. spectroscopy.
  - b) Explain effect of hydrogen bonding in vibrational frequency and vibrational coupling in I.R.
7. What is Chemical shift? Explain various factors affecting chemical shift.
8.
  - a) Why does U.V. spectrum gives to absorption bands rather than sharp peaks?
  - b) Explain molecular vibrations in I.R. spectroscopy.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.