PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2018
(Third Semester)

Branch - CHEMISTRY

MOLECULAR SPECTROSCOPY & APPLICATIONS

Time : Three Hours Maximum : 75 Marks

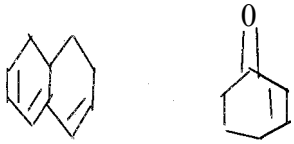
Answer ALL questions
ALL questions carry EQUAL marks (5 x 15 = 75)

1 a Write notes on enones systems and aromatic systems.

b How can we calculate the absorption maximum in polyenes using Fischer Kuhn rules?

OR

c Calculate *X* max for the following compounds :



d Write notes on spectra of molecules of addition compounds of iodine.

2 a Discuss the factors influencing vibrational frequency.

b Write down the applications of IR to organic compounds.

OR

c Write down the applications of Raman spectroscopy to organic compounds.

d The fundamental vibrational frequency of HF is 4138.5 cm'[1]. Calculate the force constants of the molecules. the atomic masses arc *H = 1.623 x 10'[27] kg and [39]F = 65,247 x 10'[27] kg.

3 a Explain the factors influencing chemical shift.

b Write notes on (i) spin-spin coupling (ii) relaxation process.

OR

c Write notes on double resonance technique.

d Write notes on pulse NMR technique and applications to organic compounds.

4 a Write the difference between *H NMR and [13]C NMR.

b How many ,[3]C NMR signals are expected for the following (i) hcxa methyl benzene (ii) neopentane?

OR

e Write notes on 2D-NMR.

d Discuss about the structure determination of boraxes and EF_6 using [13]C NMR spectroscopy.

5 a Explain about hyperfine splitting and zero field splitting,

b What is isomer shift? Explain.

OR

c Discuss about Moss Bauer Spectroscopy,

d Write notes on zero field splitting and Kramer's degeneracy.

Z-Z-Z END