Registration no: | | | | | | | | | | |

Total Number of Pages: 01

M.Sc.
MCYC201

2nd Semester Regular/ Back Examination 2016-17
SPECTROSCOPY AND MAGNETISM IN INORGANIC CHEMISTRY
BRANCH(S): Applied Chemistry
Time: 3 Hour
Max Marks: 70
Q Code : Z596
Question No.1 which is compulsory and any five from the rest
The figures in the right hand margin indicate marks.

Q1 Answer the following questions: (2 x 10)

a) For the application of IR spectrum and Raman Spectra, the molecule should have ---- ---- and ---------.
b) Calculate the Raman shift (in cm^{-1}) of the sample if Raman line is observed at 4447 ´ when it is excited by 4358 ´ line of Hg.
c) What is magnetic susceptibility?
d) Why the calculated magnetic moment of actinide complexes are larger than experimental values?
e) Mass spectrometry is the most accurate method to determine the ------ and ----- of compounds.
f) What is molecular ion?
g) Why the electronic spectra are complex?
h) What is precessional frequency?
i) Which type of nuclei show magnetic properties for the purpose of NMR spectroscopy?
j) Which radiation is utilized in EPR spectroscopy and which type of species are identified?

Q2 Write the application of mass spectroscopy to inorganic compounds.. (10)

Q3 Derive the van Vleck's equation. (10)

Q4 a) What is mixing of d and p orbitals in electronic spectroscopy? (5)
b) Explain the selection rule for electronic spectroscopy. (5)

Q5 a) Discuss the nuclear relaxation time in NMR spectroscopy. (5)
b) Explain the Application of chemical shifts. (5)

Q6 a) What is stoke's lines and antistoke's lines? (5)
b) Write the conditions for Raman spectroscopy. (5)

Q7 a) Compare the EPR and NMR spectroscopy. (5)
b) What is Pascal's constant? (5)

Q8 Write notes on any TWO (2x5)

a) contact shift
b) Curie-Weiss law.
c) Isotopic effect on mass spectrum.
d) Quadrupolar Nuclei.