Dr.R.M.L.Avadh University

B.Sc. IIIrd year

Year 2008

Paper I: General Chemistry, Molecular Spectroscopy and Analytical chemistry

Note-Answer any three questions from Section-A and five questions from Section-B

Section-A

 Outline the general methods commonly used for the determination of organic reaction Mechanism. Briefly discuss isotopic exchange and kinetic method for the determination

Of organic and Inorganic reaction mechanism.10-mark

- 2- What is microwave spectroscopy? What are selection rules? Discuss the limitations of Microwave spectroscopy and its instrumentation. 10-mark
- 3- A) What do you understand by :2,5+2.5=5 mark
 - I. Chemical shift
 - II. Applications of polarography
 - B) What are the differences between Raman spectra and Infrared spectra? 5-mark
- 4- Discuss the principle of U.V.Spectroscopy. What are electronic transitions? How many
 - types of them are known? Arrange different electronic transitions in order of decreasing

energy. 10-mark

- 5- Write short notes on the following :
 - I. Acid rain
 - II. Effect of inorganic pollutants in life

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Section -B

- 1- How many normal vibrational modes are possible for CO2 molecule? Which among them will I.R active and why? 4-marks
- 2- Discuss in brief the air pollution cause by oxides of nitrogen. 4-mark
- 3- Illustrate giving a suitable example how Redox titrations are carried out potentiometrically. 4-mark
- 4- How will you separate out the sugars present in the given mixture and find out their Rf values by the technique of paper chromatography? 4-mark
- 5- Give the applications of radio isotopes in medicine and industry. 4-mark
- 6- List all the symmetry operations for the following molecules and classify them into point groups: 2+2=4 mark
 - I. H2O
 - II. NH3

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7- Write short notes on any two of the following: 2+2+2+2=8 mark

I. Selection rules

Applications of nuclear energy

- III. Spin-Spin splitting of N.M.R. Spectroscopy
- IV. Nature of electromagnetic radiation and the spectral range.

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