



11322

B.Sc. III Semester Degree Examination, November/December 2016
Part – III : CHEMISTRY

Time : 3 Hours

Max. Marks : 80

- Instructions:** 1) Question paper has **four** Sections.
2) **All** Sections are **compulsory**.
3) Answer for **all** Sections should be written in the **same** answer book.

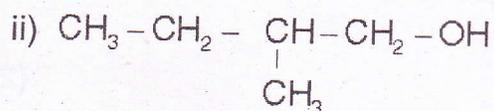
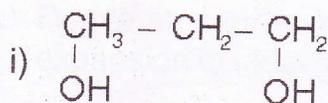
SECTION – A

(Inorganic, Organic and Physical)

Answer any ten of the following.

(10×2=20)

1. a) What is meant by solvolysis ?
- b) Draw the molecular orbital energy level diagram of H₂ molecule.
- c) What are protonic and non-protonic solvents ?
- d) What is bond order ?
- e) Define Born-Haber cycle.
- f) Write any one method of preparation of monohydric alcohols.
- g) Write the IUPAC name of :



- h) How peroxides are formed from ether ?
- i) Explain the carboxylation reaction of phenol.
- j) Phenol is more acidic than alcohol. Why ?



- k) What is refractive index ?
- l) What is half life period ?
- m) Define viscosity.
- n) Define enthalpy of a system.

SECTION – B

(Inorganic)

2. Answer **any two** of the following. (2×4=8)
- a) Give the assumption of Valence Bond Theory.
 - b) What are advantages and disadvantages of ammonia as a solvent ?
 - c) Explain the elementary idea of molecular orbital theory.
3. Answer **any two** of the following. (2×6=12)
- a) Write a note on Linear Combination of Atomic Orbital (LCAO).
 - b) Describe the M.O. energy level diagram of N_2 molecule and calculate its bond order.
 - c) Explain the following with examples :
 - i) Acid-Base reaction
 - ii) Solvation reaction
 - iii) Precipitation reaction.

SECTION – C

(Organic)

4. Answer **any two** of the following. (2×4=8)
- a) How is phenol manufactured by cumene process and write Kolbes reaction ?
 - b) Explain oxidation reaction of monohydric alcohols.
 - c) Explain ring opening of epoxides in acidic and basic medium.



5. Answer **any two** of the following.

(2×6=12)

- a) Explain the reaction of diols with lead tetra acetate and periodic acid.
- b) Explain the mechanism of the following reactions :
 - i) Fries rearrangement
 - ii) Haulben-Hoesch reaction.
- c) Discuss the cleavage of ether by acids.

SECTION – D

(Physical)

6. Answer **any two** of the following.

(2×4=8)

- a) Write a note on Joule-Thomson effect.
- b) Explain the effect of temperature on surface tension.
- c) How to determine the order of a reaction experimentally by half life period method ?

7. Answer **any two** of the following.

(2×6=12)

- a) Describe an experiment for determination of refractive index of a liquid using Abbe's refractometer.
 - b) Derive an expression for the rate constant of bimolecular reaction based on transition state theory.
 - c) Derive an expression for maximum workdone during reversible isothermal expansion of ideal gas.
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