

RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

SECOND YEAR

B.A./B.SC. THIRD SEMESTER (July – December), 2011

Mid-Semester Examination, September, 2011

Date : 13/09/2011

CHEMISTRY (General)

Time : 2 pm – 3 pm

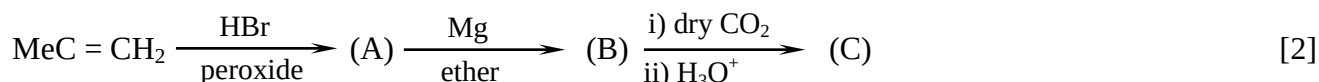
Paper : III

Full Marks : 25

Group – A

Answer **any one** question :

1. a) Identify (A) — (C)

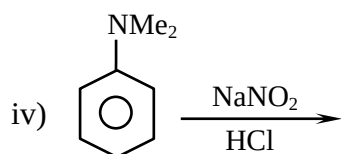
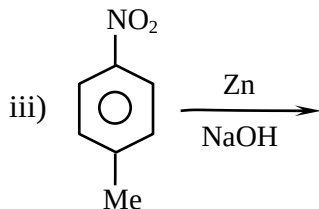
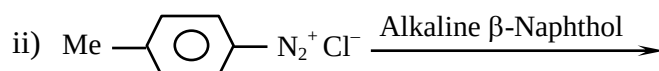
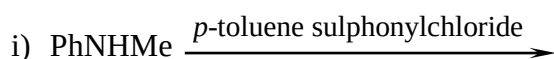


- b) What happens when MeMgI is treated with following reagent and the product hydrolyzed?

- i) Ethylene oxide
 - ii) Acetonitrile
 - iii) Benzoyl chloride
- [2×3]

2. a) Predict the product(s) of the following reactions .

[4×1]



- b) Carry out the following conversions.

[2×2]

- i) Phthalimide $\longrightarrow$ Methylamine
- ii) Nitrobenzene $\longrightarrow$ *m*-Bromonitrobenzene

Group – B

Answer **any one** question :

- 3. a) Compare and explain the basic properties of ammonia and phosphine. [3]
- b) Compare and contrast the chemistry of dithionate and polythionate. [2]
- c) Describe the preparation and properties of silicones. [4]
- 4. a) NCl_3 is hydrolysed but why not NF_3 ? [2]
- b) Comment on the molecular formula of nitrogen and phosphorous. [3]
- c) Why a small amount of glue is added in the preparation of N_2H_4 ? [2]
- d) Why is nitrogen behaves like a noble gas? [2]

Group – C

Answer **any one** from the following :

5. a) Draw constant temperature Z-P curves for a real gas at temperatures— (i) below T_b , (ii) at T_b and (iii) above T_b [3]
- b) Show that for a gas which obeys vanderWaals equation, Boyle's temp T_b is given as $T_b = \frac{a}{R_b}$ [2]
- c) Establish the relation $PV^\gamma = \text{constant}$ for an adiabatic, reversible process. [3]
6. a) Draw constant temperature P-V curves for a real gas at temperatures— (i) below T_b , (ii) at T_b and (iii) above T_b [1½]
- b) Draw the same curves for a vanderWaals gas. [1½]
- c) What are meant by—(i) Intensive Property , (ii) State function? [2]
- d) “Work involved in a reversible isothermal expansion is equal to that in a reversible isothermal compression”—Comment on it. [3]