2020

Time : 3 hours

Full Marks : 75

Pass Marks : 34

Candidates are required to give their answers in their own words as far as practicable.

The figures in the margin indicate full marks.

Answer five questions, selecting at least one from each Group in which Q. No. 1 is compulsory.

1. Explain any **three** of the following :　　5×3 = 15

   (a) Hydrolysis of ester shows pseudo unimolecular reaction.

   (b) BF_3 behaves as Lewis acid whereas NH_3 behaves as Lewis base.

   (c) Urea is also called carbamide.

   (d) Benzene is a planar molecule.

(e) Formaldehyde shows Cannizzaro reaction whereas acetaldehyde shows Aldol condensation.

Group – A

2. (a) Differentiate Osmosis and Osmotic pressures.

   (b) How can you determine the osmotic pressure of a solution ?

   (c) Find out the Osmotic pressure of 5% Urea solution.　　5+5+5 = 15

3. (a) Explain solubility and solubility product.

   (b) Give the applications of solubility product in qualitative analysis.　　$7\frac{1}{2}×2 = 15$

4. (a) Explain order and molecularity of reaction.

   (b) Derive the rate constant for first order reaction.

   (c) Half life period of First order reaction is independent of initial concentration. Justify.　　5×3 = 15

5. Write notes on any two of the following :

$$7\tfrac{1}{2} \times 2 = 15$$

(a) Ideal and non-ideal solution

(b) Ionic product of water

(c) Bronsted and Lewis theory

Group – B

6. (a) What are the conditions of geometrical isomerism ? Explain geometrical isomerism with examples.

(b) Explain optical isomerism citing proper example. $7\tfrac{1}{2} \times 2 = 15$

7. (a) Explain Hyperconjugation with suitable example.

(b) Describe Inductive effect.

(c) Explain electrophiles and nuleophiles.

$$5 \times 3 = 15$$

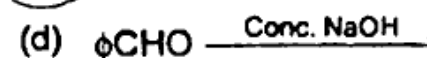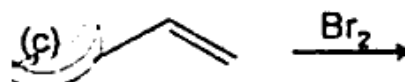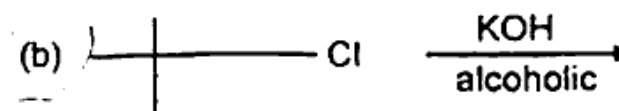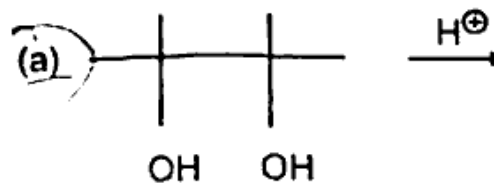8. Write an account of any three of the following reactions : $5 \times 3 = 15$

(a) Diazo coupling reaction

(b) Carbylamine reaction

(c) Wolf Kishner's reduction

(d) Hofmann Bromamide

9. Predict the product giving the mechanism of any three of the following : $5 \times 3 = 15$

10. Write notes on any three of the following :

$$5 \times 3 = 15$$
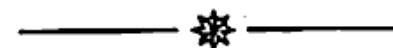
(a) Periodic acid

(b) Decarboxylation of carboxylic acids

(c) Reactivity of aldehydes and ketones

(d) Tetra valency of carbon