

Chemistry (Hons.) Paper-IV

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

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1. Explain any five of the following :

- (a) p-cresol is less acidic than p-nitrophenol.
- (b) Glucose and fructose give same osazone.
- (c) Equilibrium constant is related with free energy.
- (d) Specific conductivity decreases and equivalent conductivity increases with dilution.
- (e) Transport number is related with absolute velocities of ions.
- (f) Aqueous solution of borax is alkaline.

Group-A

2. Write notes on the following :

- (a) Le Chatelier's principle.
- (b) Arrhenius theory of electrolytic dissociation
- (c) EMF of cell

3. (a) Explain Ostwald's dilution law. How is it experimentally verified? mention its limitations.

- (b) Describe different types of reversible electrodes. Write down expression of electrode potential.

4. (a) What is quinhydrone electrode ? How is pH of solution determined with the help of quinhydrone electrode ? Mention its limitations.

- (b) Explain solubility and solubility product.

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Group-B

5. Establish open chain structure of D(+) Glucose.

6. Discuss reaction mechanism of the following name reaction.

- (a) Claisen rearrangement (b) Wittig reaction (c) Benzoin Condensation

7. Write notes on the following :

- (a) Mutarotation (b) Huckel's rule (c) Meso and racemic mixture

8. Discuss method of synthesis of the following from ethyl acetoacetate.

- (a) α,β -unsaturated acid (b) Dicarboxylic acid (c) Pentan-1, 3-dione

9. Give the mechanism of the following :

- (a) Nitration of benzene (b) Sulphonation of benzene (c) Friedel-Craft reaction

10. (a) Which of the following molecule will show cis-trans isomerism. Draw its structure and label them as E, Z-Configuration :

- (i) 2-Methyl-1-pentene (ii) 1-Chloro-2-butene (iii) 2-Methyl pentene-1

- (b) Draw the conformations of n-butane.

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