

**PARUL UNIVERSITY**  
**FACULTY OF APPLIED SCIENCE**  
**B.Sc., Winter 2017-18 Examination**

**Semester: 3**  
**Subject Code: 11105201**  
**Subject Name: Fundamentals of Chemistry-I**

**Date: 19/12/2017**  
**Time: 10:30 to 1:00 pm**  
**Total Marks: 60**

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**Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

**Q.1. A) Answer the following questions.**

- (a) Explain Arrhenius concept for acid and base. (04)  
(b) State HSAB principle. Give 3 applications of HSAB principle. (04)

**Q.1. B) Answer the following questions (Any two)**

- (a) 1. Explain Luxflood concept for acid and base. (04)  
2. What is leveling effect?  
(b) Explain effect of solvent on relative strength of acid and base. (04)  
(c) Explain Lewis acid base concept. (04)

**Q.2. A) Answer the following questions.**

- (a) Give structural formula for: (1) 3-Methyl butan-1-ol (04)  
(2) Isopropyl alcohol  
(3) Catechol  
(4) Picric acid  
(b) Give methods of preparation of alcohols from alkene following (1) Markovnikov's Rule and (04)  
(2) Anti Markovnikov's Rule giving any one reaction of it.

**Q.2. B) Answer the following questions (Any two)**

- (a) **Fill in the blanks (Each of 01 marks)** (03)  
1. Reaction of 1° alcohol with carboxylic acid in acidic medium results in formation of \_\_\_\_\_.  
2. If number of carbon atoms increases in chain of alcohol, then the solubility of alcohol in water \_\_\_\_\_.  
3. Reaction of alcohols with Grignard reagent results in formation of \_\_\_\_\_.  
(b) What is Lucas Reagent? Give its use? (03)  
(c) What is saponification? Explain giving reaction. (03)

**Q.3. A) Answer the following questions (Each of 04 marks)** (08)

- (a) Give preparation of Ethylene glycol from ethene giving reaction.  
(b) Give any one method of preparation of glycerol giving reaction.

**Q.3. B) Answer the following questions (Any two)**

- (a) **Short note (Each 02 marks)** (04)  
1. Give uses of glycerol.  
2. Give uses of ethylene glycol.  
(b) Write preparation of phenols by Dow's process. (04)  
(c) Write reaction for esterification of glycerol. (04)

**Q.4. A) Answer the following questions.**

- (a) **Short note (Each 02 marks)** (04)  
1. State Charle's law and write its equation.  
2. State Boyle's law and write its equation.  
(b) What is ideal gas and real gas? (04)

**Q.4. B) Answer the following questions (Any two)**

- (a) Derive van der Waal's equation of state. (03)  
(b) Write postulates for kinetic theory of gas. (03)  
(c) Write any 3 applications of gas laws. (03)