

## FACULTY OF SCIENCE

B.Sc. I-Semester (CBCS) Examination, December 2017

Subject: Chemistry

Paper - I

Time: 3 Hours

Max. Marks: 80

## PART - A (5 x 4 = 20 Marks)

(Short Answer Type)

Note: Answer any FIVE of the following questions.

- 1 Discuss any four similar properties of Li and Mg.
- 2 Write the reactions of  $CO_3^{2-}$
- 3 Arrange the following carbocations in decreasing order of stability and explain.  
 $H_3C^+$ ,  $RCH_2^+$ ,  $R_2CH^+$ ,  $R_3C^+$
- 4 Give the synthesis of cyclopentane from (i)  $\alpha$ ,  $\omega$  - dibromoalkane (ii) dicarboxylic metal salts.
- 5 Calculate the uncertainty in the position of a particle when the uncertainty in the momentum is  $1 \times 10^{-2} \text{ gm cm sec}^{-1}$ .
- 6 Explain Linde's method of liquefaction of gases.
- 7 Write a note on Fajan's rules.
- 8 Discuss the classification of errors.

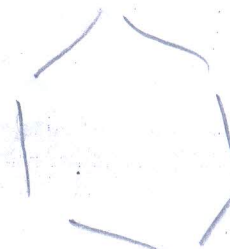
## PART - B (4 x 15 = 60 Marks)

(Essay Answer Type)

Note: Attempt ALL the questions.

- 9 (a) (i) Classify silicones. Give one method of preparation for each type of silicone.  
(ii) Write the preparation and properties of hydrazine.  
OR
- (b) An inorganic compound contains  $Hg_2^{2+}$ ,  $Ag^+$ ,  $Pb^+$  ions. How will you identify them? Explain with chemical equations.
- 10 (a) (i) What are the products of the following reactions?  
 $CH_2 = CH - CH = CH_2 + Br_2 \rightarrow ?$   
Explain the mechanism.  
(ii) What is Diels - Alder reaction? Explain.  
OR
- (b) (i) Phenols are stronger acids than alcohols but weaker than the carboxylic acids. Explain.  
(ii) Write a note on conformational structures of cyclohexane.
- 11 (a) (i) Discuss the effect of pressure on volume of carbon dioxide at different temperatures.

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- (ii) The Vander Waals constants for 1g molecule of carbon dioxide are  $a = 3.609 \times 10^6 \text{ ml}^2 \text{ atm mole}^{-2}$  and  $b = 42.75 \text{ ml mol}^{-1}$ ; Calculate the values of three critical constants ( $R = 0.082 \text{ litres atm K}^{-1} \text{ mol}^{-1}$ ).

OR

- (b) (i) What is viscosity of a liquid and how coefficient of viscosity can be determined using Ostwald viscometer?  
(ii) Discuss the radial probability distribution curves for H – atom.

12 (a) (i) Explain the paramagnetic behaviour of  $\text{O}_2$  molecule with the help of Molecular orbital energy diagram.

- (ii) Calculate absolute error for the following set of replicate measurements for which the true value is 16.28.

16.40, 16.36, 16.26, 16.34

OR

- (b) (i) What is the hybridization of iodine in  $\text{IF}_7$  molecule ? Explain.  
(ii) Give the molecular orbital energy diagram of HF molecule.

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