

**FACULTY OF SCIENCE**  
**B.Sc. (CBCS) III – Semester Examination, December 2017**  
**Subject : CHEMISTRY**

Paper – III

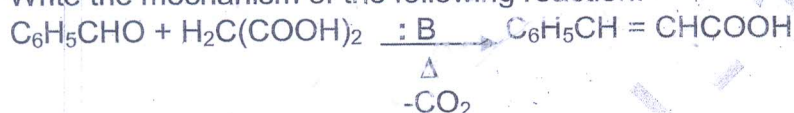
Time : 3 hours

Max. Marks : 80

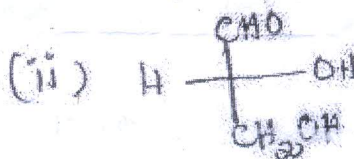
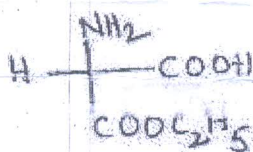
**Part – A (5 X 4 = 20 Marks)**  
 (Short Answer Type)

**Answer any Five of the following questions.**

- 1 Write the electronic configuration of  $\text{Eu}^{2+}$ ,  $\text{Yb}^{2+}$ ,  $\text{Ce}^{4+}$  and  $\text{Tb}^{4+}$  ions.
- 2 What is centre of symmetry? Explain with two examples.
- 3 Give the reactions for the preparation of  $1^\circ$ ,  $2^\circ$  and  $3^\circ$  alcohols using Grignard reagent.
- 4 Write the mechanism of the following reaction.



- 5 Discuss the principle involved in cleansing action of soap.
- 6 State phase rule and explain the terms in it.
- 7 Write a note on structural features of grapheme.
- 8 Give the R and S configuration of the following structures:



**Part – B (4 X 15 = 60 Marks)**  
 (Essay Answer Type)

**Answer ALL questions from the following:**

- 9 a) i) Illustrate the rotation-reflection operation in trans-1,2-dichloroethane and methane.  
 ii) Write about the ion-exchange method for the separation of lanthanides.  
**OR**
- b) i) Explain the differences between lanthanides and actinides.  
 ii) Discuss the reactions that take place in liquid ammonia.
- 10 a) i) Discuss the action of conc.  $\text{H}_2\text{SO}_4$  and action of HI with ethers.  
 ii) Give the product and mechanism of the following reaction.



**OR**

- b) Write note on
  - i) Schotten – Boumann reaction
  - ii) Meerwein Ponnoff verly reduction
  - iii) Gattermann-Koch reaction

11 a) Explain phase diagram of Mg-Zn system.

OR

b) Discuss the Langmuir theory of adsorption.

12 a) i) Discuss the methods of production of carbon nanotubes.

ii) Explain the methods of resolution of racemic mixtures.

OR

b) i) Give the conformational analysis of 1,2-dichloroethane.

ii) Write the structural formulae of all tartaric acids, indicate asymmetric carbon atoms.

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