This question paper contains 4 printed pages]

Roll No. | | | | | | | | | | | |

S. No. of Question Paper : **5029**

Unique Paper Code : **2174001002**

Name of the Paper : **GE-Basic Concepts of Organic Chemistry**

Name of the Course : **B.Sc. (Hons.)**

Semester : **II/IV/VI/VIII**

Duration : **2 Hours** Maximum Marks : **60**

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *four* questions in all.

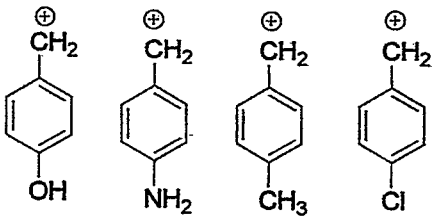
Question No. **1** is compulsory.

All parts of a question should be attempted together.

All questions carry equal marks.

1. (*a*) What is Relative Configuration ? How is it different from Absolute Configuration ?

(*b*) Arrange the following intermediates into decreasing order of stability. Give suitable reasons for your answer.



P.T.O.

(c) Give the major product formed when propene reacts with HBr in presence of peroxides. Explain.

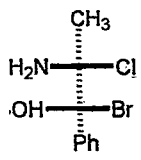
(d) Differentiate between electrophile and nucleophile. Give an example of ambidentate nucleophile.

(e) What is a Meso Compound ? Explain why it is optically inactive despite possessing chiral centers. 5×3

2. (a) Explain the mechanism of Firedel-Crafts alkylation of benzene using methyl chloride, including the role of the catalyst.

(b) Draw the Fischer projections for all the possible stereoisomers of butan-2, 3-diol. State the correlation among these stereoisomers. Comment on the optical activity of these isomers.

(c) Convert the following compound (A) from one projection into another :

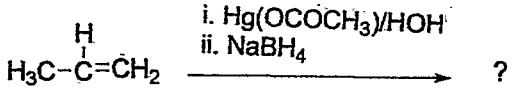


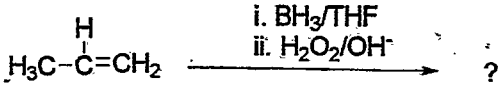
(A)

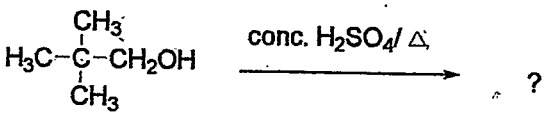
(i) Fischer to Staggered Sawhorse

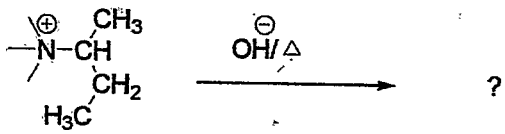
(ii) Fischer to Eclipsed Newman. 3×5

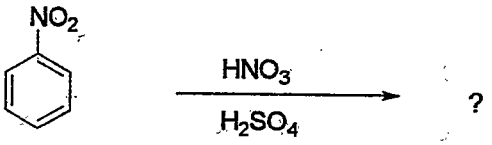
3. Write down all the probable product/s and name the reaction involved in the following reactions :

(a) 

(b) 

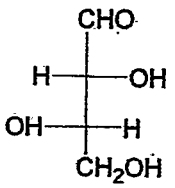
(c) 

(d) 

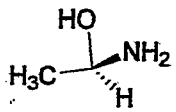
(e) 

5×3

4. (a) Assign R/S configuration to the following compounds :

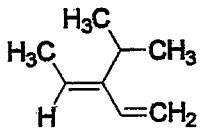


(i)

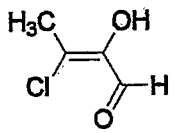


(ii)

(*b*) Assign E/Z configuration to the following compounds :



(i)



(ii)

(*c*) What is Hyperconjugation ? Arrange the following alkenes in decreasing order of stability giving suitable reasons :

(*i*) 1-Butene

(*ii*) trans-2-butene

(*iii*) 2-Methyl 1-2-butene. 3×5

5. (*a*) (*i*) Differentiate between inductive effect and electrometric effect giving suitable example.

(*ii*) The pKa of *p*-nitrophenol is lower than that of *m*-nitrophenol. Explain.

(*b*) Write a short note on Huckel's rule of aromaticity. Explain why cyclopropenyl cation is more stable than cyclopropenyl anion.

(*c*) Define "Resolution" and explain the methods used for the resolution of a racemic mixture. 3×5

6. Write short notes on any *three* of the following :

(*a*) Free Radical halogenation of alkanes

(*b*) Ozonolysis

(*c*) SN^1 and SN^2 mechanism of nucleophilic substitution reactions

(*d*) Biological dehydration reactions.

(*e*) Directing effects of substituent groups in electrophilic aromatic substitution. 5×3