

CHE-6

**BACHELOR OF SCIENCE (B.Sc.)**

**Term-End Examination**

**December, 2005**

**CHEMISTRY**

**CHE-6 : ORGANIC REACTION MECHANISM**

*Time : 2 hours*

*Maximum Marks : 50*

**Note :** Attempt any **four** questions. All questions carry equal marks.

1. (a) Arrange the following halides in the increasing order of their reactivity towards  $S_N2$  reaction :  $1\frac{1}{2}$   
 $C_6H_5CH_2Br$ ;  $CH_2 = CH - CH_2Br$ ;  $CH_3Br$
- (b) What is isotopic labelling ? How is it used to probe the mechanism of a reaction ? Explain with example. 3
- (c) Why is 2-chloroethyl ethyl sulphide hydrolysed in acetone 10,000 times faster than the corresponding ether ? 3

CHE-6

1

P.T.O.

- (d) (i) Nitrobenzene upon nitration with fuming  $\text{HNO}_3/\text{H}_2\text{SO}_4$  mixture forms *m*-dinitrobenzene as the major product. Explain with mechanism. 3
- (ii) Why are alkenes more reactive than alkynes towards electrophilic addition reactions? 2
2. (a) What are stereospecific and stereoselective reactions? Explain with one example in each case.  $4\frac{1}{2}$
- (b) Write a detailed note on any **two** of the following rearrangements : 8
- (i) Pinacol-pinacolone rearrangement
- (ii) Benzil-benzilic acid rearrangement
- (iii) Hofmann rearrangement
3. (a) What is the product obtained when neopentyl bromide is heated with dilute ethanol? Write all the steps involved.  $3\frac{1}{2}$
- (b) Give structures and names of the two isomeric products obtained when  $\text{C}_6\text{H}_5\text{CH}_2\text{CHClC}_6\text{H}_5$  reacts with alcoholic KOH. Give mechanism of the reaction. 3
- (c) Give mechanism for the reaction of propene with N-bromosuccinimide. 3
- (d) What are singlet and triplet carbenes? Draw their structures. 3

4. (a) How will you prepare any **two** of the following :  $2\frac{1}{2}\times 2$

- (i) Propanone from diethyl malonate
- (ii) Acetyl acetone (pentane-2,4-dione) from ethyl acetoacetate
- (iii) *p*-bromoaniline from aniline

(b) Write short notes on any **three** of the following :  $2\times 3$

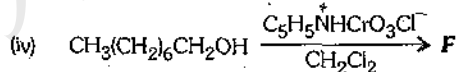
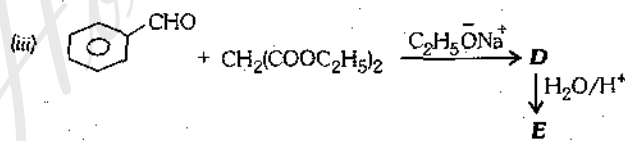
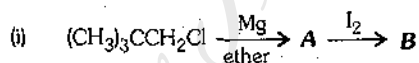
- (i) Fluorescence
- (ii) Photosensitisation
- (iii) Radical anion
- (iv) Intersystem crossing

(c) Arrange following radicals in the increasing order of their stability :

$1\frac{1}{2}$



5. (a) Complete the following reactions : 6



- (b) What is the pathway for the photolysis of acetone ?  
Give various products formed.  $4\frac{1}{2}$
- (c) Comment on the relative inertness of benzene  
towards addition reactions. 2
6. (a) How are dyes classified on the basis of application ?  
Give the method of preparation of an azo dye.  $4\frac{1}{2}$
- (b) How is aspirin produced from phenol ? 2
- (c) What are addition and condensation polymers ? Give  
the preparation of one polymer of each kind. 4
- (d) State Markownikoff's rule with suitable example. 2