

CHE-5

BACHELOR OF SCIENCE (B.Sc.)

Term-End Examination

December, 2005

CHEMISTRY

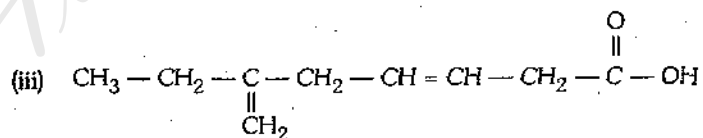
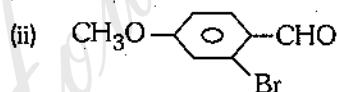
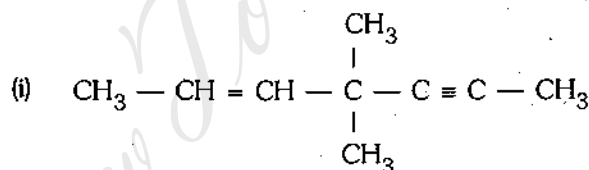
CHE-5 : ORGANIC CHEMISTRY

Time : 2 hours

Maximum Marks : 50

Note : Attempt **all** the four questions.

1. (a) Give the IUPAC names of any **two** of the following : 1+1



CHE-5

1

P.T.O.

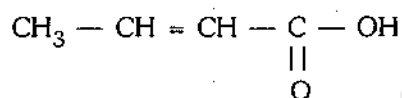
(b) Write the structural formula of any **two** of the following : 1+1

(i) 2-chloro-4-hydroxypentanoyl chloride

(ii) 2,2,4-trimethyl pentane

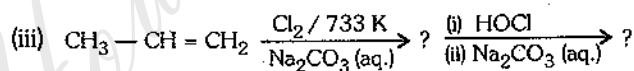
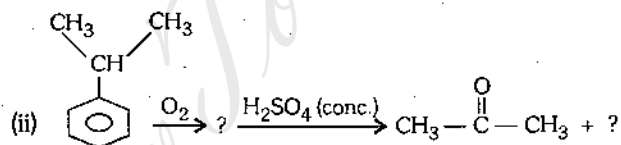
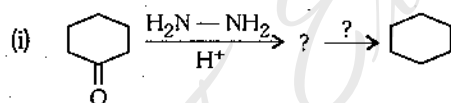
(iii) 2-methylhept-6-en-3-ynamide

(c) Identify the chromophore(s) present in the following compound : 1



2. Attempt any **five** questions from the following :

(a) Answer any **two** from the following : 2



(b) Arrange the following in the increasing order of their acid strength :

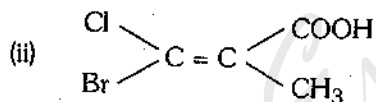
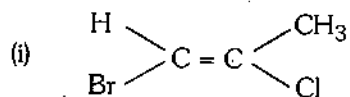
Fluoroethanoic acid, ethanoic acid and methoxyethanoic acid

Give reason in support of your answer. 2

(c) Assign *R* or *S* configuration to
D — (+) — glyceraldehyde. 2

(d) Which one is more stable — a tertiary carbocation
or a primary carbocation ? Explain using
hyperconjugation. 2

(e) Assign the configuration as *E* or *Z* to the following
compounds : 2



(f) What happens when glycol is treated with 2

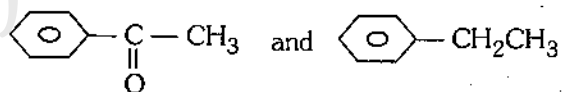
(i) Na at 327 K ?

(ii) Na at 423 K ?

(g) Define iodine value and saponification value. 2

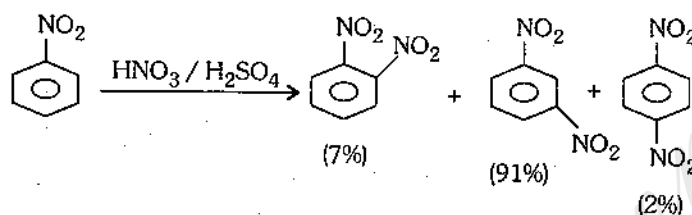
3. Attempt any **five** of the following questions :

(a) Define chemical shift. Using I.R. and N.M.R. spectral
techniques, differentiate between : 3



- (b) What happens when 1×3
- (i) 4-chloropyridine is treated with ammonia ?
 - (ii) Pyrrole is treated with acetic anhydride ?
 - (iii) Primary amine is reacted with chloroform in presence of alkali ?
- (c) Give one example of each of the following reactions : 3
- (i) Oppenauer oxidation
 - (ii) Wittig reaction
 - (iii) Gattermann – Koch synthesis
- (d) Give the reaction of 3
- (i) chloroform with silver powder.
 - (ii) chloromethane with sodium metal.
 - (iii) 1-bromo-1-butene with HBr in the presence of peroxide.
- (e) Give one example for each of the following categories of compounds : 3
- (i) disaccharide
 - (ii) antibiotic
 - (iii) alkaloid
- (f) Electrophilic substitution in pyridine takes place at 3-position. Explain. 3

- (g) The nitration of nitrobenzene yields *m*-dinitrobenzene as major product as shown below :



Explain giving reason.

3

4. Attempt any **five** of the following :

- (a) An organic compound A reacts with soda-amide followed by methyl iodide and produced 'B'. B on treatment with 40% H_2SO_4 in the presence of mercuric ions yields 'C'. On treatment with iodine and alkali, 'C' yields iodoform and a carboxylic acid 'D' whose molecular mass is 60. Identify A, B, C and D. 4
- (b) An organic compound A on ozonolysis gives two products B and C. Both B and C give positive Tollen's test. B gives iodoform and carboxylic acid D when treated with iodine and alkali. Acid D is the oxidation product of compound C. Acid D gives Tollen's test. Identify A, B, C and D. 4
- (c) Give one example of the following reactions : 4
- (i) Perkin reaction
 - (ii) Benzoin condensation
 - (iii) Reimer - Tiemann reaction
 - (iv) Williamson synthesis

- (d) How are primary, secondary and tertiary amines differentiated with the help of Hinsberg reagent ? 4
- (e) What is Michael addition ? How will you synthesize 5-oxohexanoic acid using it ? 4
- (f) Attempt any **two** of the following : 4
Explain the mechanism of
- (i) Birch reduction
 - (ii) Kolbe's electrolytic method for the preparation of alkenes
 - (iii) Aldol condensation
- (g) Give the products of the following reactions (attempt any **four**) : 4

