Exam.Code:0007
Sub. Code: 0631

2012

B.A./B.Sc. (Hons.) Third Semester

Chemistry

Paper – I: Organic Chemistry – A

Time allowed: 3 Hours. Max. Marks: 22

NOTE: *Attempt five questions in all, including Question No. 9 (Unit-V) which is compulsory and selecting one question each from Unit I -IV.*

x-x-x

UNIT-I

1. (a) Show, by writing equations, how a nitrene intermediate may be formed in the Lossen, curtius and Schmidt reactions? (2)

(b) Give the detailed mechanism of Baeyer-Villiger rearrangement of propanal. (2)

2. (a) Give the structure of A in the following reaction;

$$(C_2H_5)_2CHCONH_2 \xrightarrow[Br_2]{NaOH} A$$ (3)

Provide a mechanism for the same reaction

(b) What is the effect on stereochemistry of migratory group in Curtius rearrangement? (1)

UNIT-II

3. (a) Write the pinacol-pinacolone rearrangement in 2,3-diphenylbutane-2,3-diol. Explain important step governing the rearrangement. (2)

(b) Name the following rearrangement and give its mechanism; (2)

$$R-\overset{O}{\overset{\|}{C}}-CHN_2 \xrightarrow[H_2O]{Ag_2O} R\text{-}CH_2COOH$$

4. (a) Which phosphonium halide and carbonyl compound must be used in a Wittig reaction to synthesize following compound; (2)

$$H_3CH_2CHC{=}C(CH_2CH_3)_2$$

Also explain the mechanism using best of all possible combinations.

(b) Explain briefly migratory aptitude in hydroperoxide rearrangement. (2)

UNIT-III

5. (a) What are conformational effects on reactivity? Discuss in detail. (2)

(b) Give a brief account on the relationship of the ring size and facility of ring closure. (2)

6. (a) Predict the hydrogen atoms in *cis- and trans*-1,2-dichlorocyclopropane and its *trans*-isomer as homotopic, enantiotopic or diastereotopic. (3)

(b) Why 5-membered carbocyclic rings are more stable than 3-membered carbocyclic rings? (1)

UNIT-IV

7. (a) How pKa value of different compounds changes under the influence of; (3)

(i) Field effect (ii) Resonance effect

Explain by giving different examples.

(b) What are regio-selective and stereo-selective reactions? (1)

8. (a) Explain the mechanism of Stork-enamine reaction. What are its advantages over simple alkylation of ketones? (3)

(b) What is Hard Soft Acid Base principle? Give example. (1)

UNIT-V

9. (a) Why the rate of reaction changes with change in migrating group?

(b) Define non-classical carbocations.

(c) How torsional strain differs from angle strain?

(d) Give the example of generation of carbon nucleophile by deprotonation.

(1.5 mark each)

x-x-x