PARUL UNIVERSITY
PARUL INSTITUTE OF APPLIED SCIENCES
MID SEMESTER INTERNAL EXAMINATION, SEPTEMBER-2018
M. Sc. Semester I
Subject: Chemistry
Paper Name: Organic Chemistry-I

Paper Code: 11205101
Maximum Marks: 40
Date: 04/09/2018 **Time: 1.5 hrs.**

Instructions:
1. All questions are compulsory and options are in first and second question only.
2. Numbers to the right of question indicate the marks of respective question.
3. Give your answers with appropriate **EXAMPLES** where it is necessary.

Q. 1 Attempt any one question of the following. **(08)**

I. Explain hydrohalogenation mechanism of alkynes. Explain the rate equation for S_N1 reactions. [5+3]

II. Explain the geometry of olefinic carbon. How electron donating groups affects the stability of carbocations? In which mechanism racemic product is formed? [4+3+1]

Q. 2 Attempt any three questions of the following. **(12)**

I. How the strength of nucleophiles affect the nucleophilic substitution reactions?

II. How leaving group and solvent affects the bimolecular electrophilic substitution (S_E2) reaction?

III. Give four differences between nucleophiles and electrophiles?

IV. Explain Markovnikov's rule for electrophilic addition reaction with suitable examples.

V. Explain halohydrin formation mechanism in alkenes.

Q. 3 Do as directed. Attempt all five questions. **(05)**

I. Why iodide is a better leaving group than chloride?

II. What is aprotic solvent?

III. Why protic solvents are used in S_N1 mechanism?

IV. Why 3^0 carbocation is more stable than 1^0 carbocation?

V. What do you mean by inversion?

Q. 4 Write correct option in your answer sheet for following 15 multiple choice questions. **(15)**

MCQ 1 Br^- and Cl^- are examples of

(A) Nucleophiles (B) Electrophiles
(C) Free radicals (D) All of these

MCQ 2 $AlCl_3$ is an

(A) Nucleophiles (B) Electrophiles
(C) Free radicals (D) All of these

MCQ 3 In homolytic bond fission, this is formed.

(A) Nucleophiles (B) Electrophiles
(C) Free radicals (D) All of these

MCQ 4 Transition state is formed in

(A) S_E2 reactions (B) S_N2 reactions

(C) Both in A and B (D) None of these

MCQ 5 In the hydrolysis of an alkyl bromide, under basic conditions

(A) Attacking nucleophile is OH^- and leaving group is Br^-. (B) Attacking nucleophile is Br and leaving group is OH^-.

(C) Attacking electrophile is OH^- and leaving group is Br^-. (D) Attacking electrophile is Br and leaving group is OH^-.

MCQ 6 For a S_N2 reaction

(A) A protic solvent is best (B) An aprotic solvent is best

(C) Both can be used. (D) No effect of solvent.

MCQ 7 For a S_N2 reaction, configuration of product formed is

(A) Inverted (B) Retained

(C) Both A and B (D) Stereochemistry independent

MCQ 8 For S_N1 reaction, which statement is correct

(A) Racemic product is formed (B) Halogens are best leaving groups

(C) It is a two-step process (D) All of these

MCQ 9 When the solvent acts as nucleophile in S_N1 reaction, process is called

(A) Solution (B) Solvation

(C) Solubility (D) Solvolysis

MCQ 10 In S_N1 reaction, solvent with high dielectric constant value

(A) Stabilizes the transition state (B) Destabilizes the transition state

(C) Not affect the transition state (D) None of these

MCQ 11 Example(s) of polar protic solvent

(A) Water (B) Methanol

(C) Formic acid (D) All of these

MCQ 12 Order of leaving group from good to worst

(A) $I^- > Br^- > Cl^- > F^-$ (B) $I^- < Br^- < Cl^- < F^-$

(C) $I^- > Br^- > F^- > Cl^-$ (D) $I^- < Br^- < F^- < Cl^-$

MCQ 13 A good leaving group is a

(A) Weak base (B) Strong base

(C) Weak acid (D) Strong acid

MCQ 14 In electrophilic substitution reaction, polar solvents favor

(A) S_E1 mechanism (B) S_E2 mechanism

(C) Both mechanism (D) No effect on any mechanism

MCQ 15 Which statement is correct for alkenes

(A) Trigonal planar geometry (B) Generally electrophilic

(C) SP^3 hybridization (D) Both B and C

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