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E-6312

M.Sc. (Ist Semester) Examination, 2021

CHEMISTRY

(Organic Chemistry - I)

Time Allowed : Three Hours

Maximum Marks : 70

Note : (i) Section A : Objective type. Attempt any 10 questions. Each question carries one mark. Question (1 – 5) fill in the blanks type. Question no. (6 – 12) multiple choice type.

(ii) Section B : Very short answer type (25 – 30 words). Attempt any five questions. Each question carries 2 marks. Question No. (1 – 7).

(iii) Section C : Short answer type (250 words). Attempt any five questions. Each question carries 4 marks. Question No. (1 – 7)

(iv) Section D : Essay type (more than 500 words). Attempt any three questions. Each question carries 10 marks. Question No. (1 – 4)

SECTION - A

Note : Attempt any ten questions. Each question carries one mark.

Fill in the blanks :

Q. 1. SN_2 reaction always involves _____.

Q. 2. Carbenes are intermediate in which the radical is carried by the carbon atom with _____ electrons in the valence shell.

Q. 3. A pair of stereoisomers which has no mirror image relationship is known as pair of _____.

Q. 4. In E_2 reaction the dihedral angle of antiperiplanar conformation is _____.

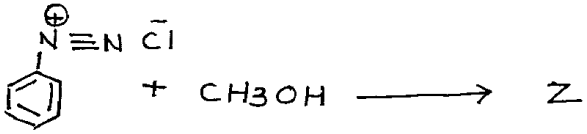
Q. 5. A position which is already occupied by a non hydrogen substituent is an aromatic ring is called _____ position.

Q. 6. Racemic mixture is optically inactive because of :

(i) External Compensation

(ii) Molecular Symmetry

(iii) Internal Compensation

Q. 7. 

Identify the Z :

(i) C_6H_6

(ii) C_6H_5OH

(iii) $C_6H_5OCH_3$

(iv) $C_6H_5CH_3$

Q. 8. The preferred conformation of trans 1, 2 dibromo cyclohexane is :

(i) Diaxial

(ii) Diequatorial

(iii) Axial, equatorial

(iv) Neither (i), (ii) nor (iii)

Q. 9. Phenol can be converted into salicylic acid using :

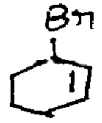
(i) CO_2 and alkali under pressure

(ii) CCl_4 in alkali

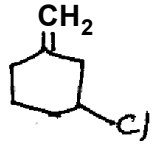
(iii) $CHCl_3$ in alkali followed by oxidation

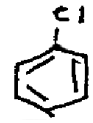
(iv) None of these

Q. 10. Identify the allylic halide :

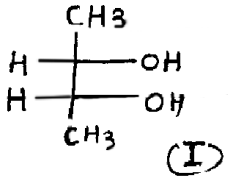
(i) 

(ii) 

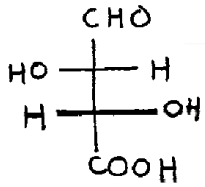
(iii) 

(iv) 

Q. 11. Compound I and II are respectively :



(I)



II

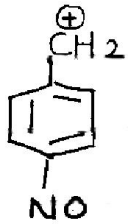
(i) Erythro, erythro

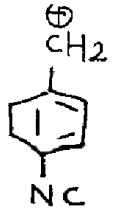
(ii) Threo, erythro

(iii) Erythro, threo

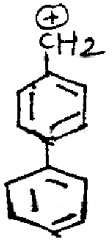
(iv) Threo, threo

Q. 12. The most stable carbocation is :

(i) 

(ii) 

(iii) 

(iv) 

SECTION - B

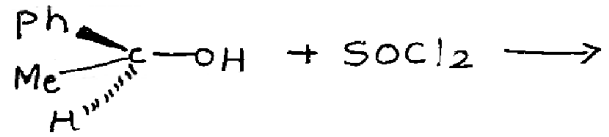
Note : Attempt any five questions. Each question carries 2 marks. (Word limit 25-30 words) : **2×5=10**

Q. 1. Discuss ipso attack.

Q. 2. Explain the structure of triplet nitrene.

Q. 3. Explain threo and erythro nomenclature.

Q. 4. Complete the following reaction :



Q. 5. Discuss the stability of nitromethyl carbanion.

Q. 6. Explain unimolecular elctrophilic substitution reaction. (SE1 reaction).

Q. 7. Explain transition state.

SECTION - C

Note : Attempt any five questions. Each question carries 4 marks. (Word limit – 250 words) : **4×5=20**

Q. 1. Discussn the Von Richter rearrangement reaction mechanism giving suitable example.

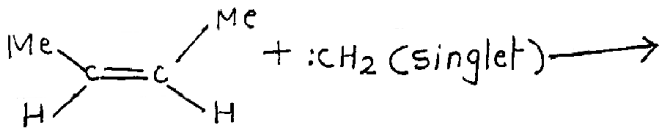
Q. 2. Discuss absolute configuration of biphenyls.

Q. 3. Explain the stereochemistry of 9-Methyl decaline.

Q. 4. What is SN1 reaction ? Explain with energy profile diagram and stereochemistry.

Q. 5. The reaction of bromoanisole with sodamide in liquid ammonia gives only m-amino anisole. Explain the regioselectivity.

Q. 6. The major product formed in the following reaction, explain it.



Q. 7. Nitrobenzene does not give Friedel Craft reaction why ?

SECTION - D

Note : Attempt any three questions. Each question carries 10 marks. (Word limit 500 words) : **10×3=30**

Q. 1. Discuss the geometrical isomerism due to C=C, C=N containing carbon compounds and explain E, Z notation.

Q. 2. Explain activation and deactivation of the benzene ring by taking the example of OH and NO_2 group. Give possible explanation for toluene is more easily nitrated than benzene.

Q. 3. Give reaction mechanism of following :

(i) Gattermann Koch reaction

(ii) Peterson reaction.

Q. 4. What is ambident nucleophile ? Discuss neighbouring group participation mechanism. Explain with suitable example.