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NEPNY—24—2023

FACULTY OF SCIENCE AND TECHNOLOGY

M.Sc. (NEP) (First Semester) EXAMINATION

NOVEMBER/DECEMBER, 2023

CHEMISTRY

Paper SCHEC-402

(Organic Chemistry–I)

(Friday, 22-12-2023)

Time : 10.00 a.m. to 1.00 p.m.

Time—Three Hours

Maximum Marks—80

N.B. :- (i) Question No. 1 is compulsory.

(ii) Solve any *three* from remaining five questions.

(iii) Simple calculator and log table is allowed.

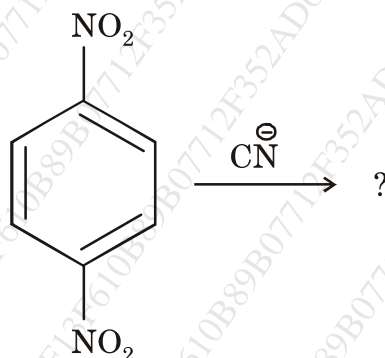
1. Solve the following :

20

(i) Cyclopentadiene is acidic in nature. Explain.

(ii) S_N^2 reaction is an example of both stereoselective and stereospecific reactions ? Explain.

(iii)



Predict the product of above reaction with mechanism.

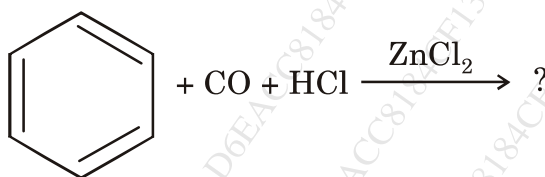
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(2)

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(iv)



Predict the product of above reaction with mechanism.

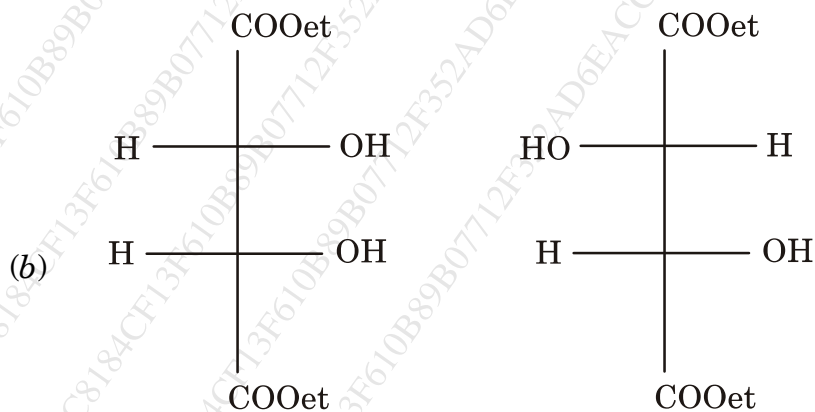
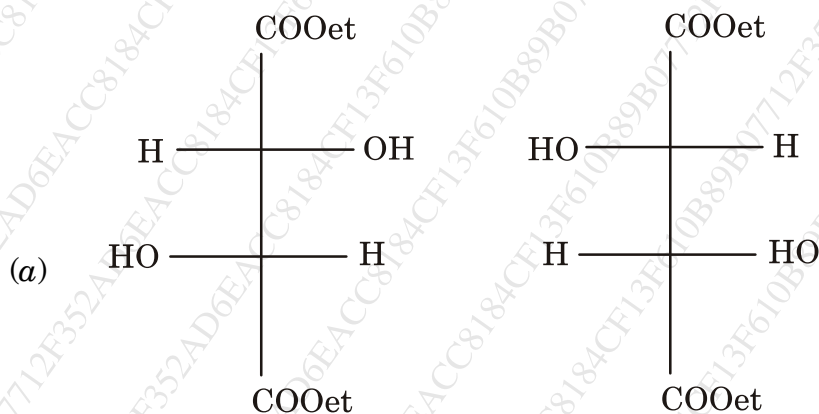
2. Solve the following : 20

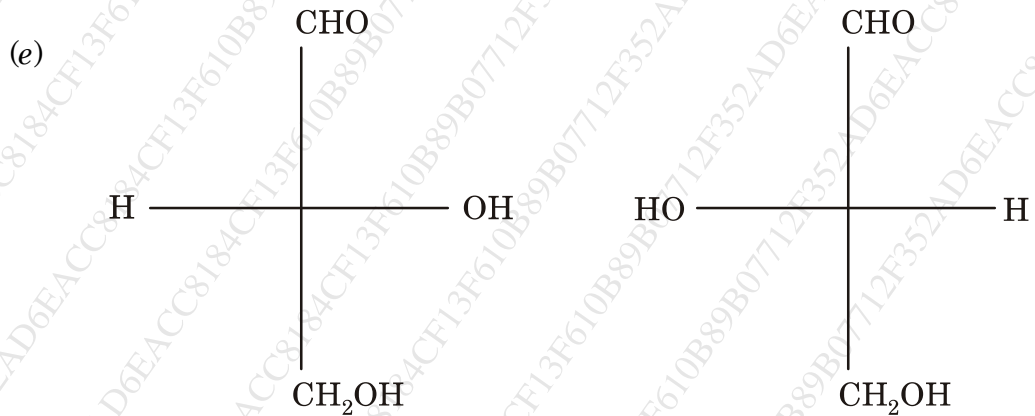
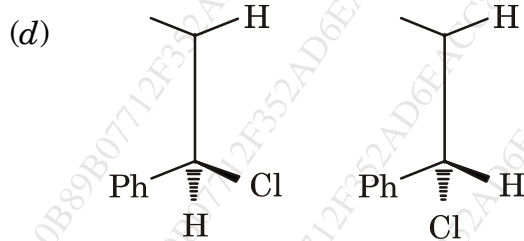
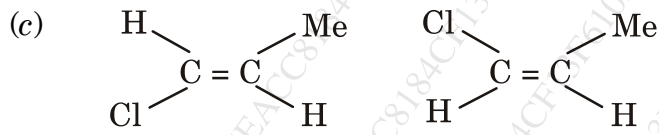
(i) Give the generation, structure and stability of carbene and nitrene.

(ii) Discuss $\text{S}_{\text{N}}^{\text{i}}$ reaction with mechanism and give the vinylic substitution in nucleophilic reaction.

3. Answer the following : 20

(i) Assign configuration and describe their relationship :





(ii) Explain the orientation and reactivity of aniline, nitrobenzene and chlorobenzene towards ESR.

4. Explain the following :

20

(i) Explain the following terms with proper example :

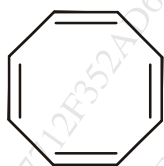
(a) Conformation of Glucopyranose.

(b) Conformation of cyclohexane 1, 4-diol.

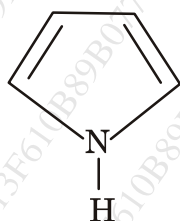
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- (ii) Explain the term homoaromaticity and antiaromaticity. Discuss the aromaticity of the following compounds :

(a)



(b)



5. Discuss the following : 20

- (i) Explain the effect of substrate, attacking nucleophile and leaving group in aliphatic nucleophilic substitution reaction.
- (ii) Explain quantitative treatment of reactivity in substrate and electrophile with their o/p ratio.

6. Write short notes on the following : 20

- (i) Benzenoid and non-benzenoid compounds
- (ii) Enantiotopic and diastereotopic faces
- (iii) Anchimeric assistance
- (iv) Diazo-coupling reaction.