

2022

CHEMISTRY

Paper : CC-9

(Organic Chemistry—III)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

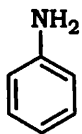
1. Choose the correct answer from the following : 1×5=5
- (a) The IUPAC name of $\text{CH}_3\text{CH}(\text{CH}_3)-\text{C}\equiv\text{N}$ is
- (i) isopropyl cyanide
 - (ii) isobutyronitrile
 - (iii) 2-methyl propane nitrile
 - (iv) None of the above
- (b) Reduction of *m*-dinitrobenzene with $(\text{NH}_4)_2\text{S}$ or NaSH gives
- (i) *m*-phenylenediamine
 - (ii) *m*-nitroaniline
 - (iii) aniline
 - (iv) azoxybenzene

(2)

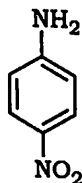
(c) Preparation of primary amine can be done by

- (i) Hofmann degradation of amide
- (ii) carbylamine reaction
- (iii) aldol condensation
- (iv) Mannich reaction

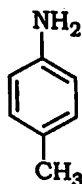
(d) The correct increasing order of basic strength for the following compounds



(I)



(II)



(III)

is

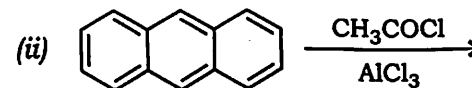
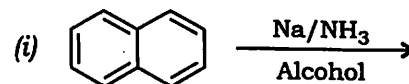
- (i) II < III < I
 - (ii) III < I < II
 - (iii) III < II < I
 - (iv) II < I < III
- (e) Naphthalene undergoes oxidation with $\text{Na}_2\text{Cr}_2\text{O}_7/\text{H}_2\text{SO}_4$ to form
- (i) phthalic acid
 - (ii) benzoic acid
 - (iii) tetralin
 - (iv) phenylacetic acid

(3)

2. Answer the following questions : 2×5=10

- (a) Explain why ethylamine is a stronger base than ammonia.
- (b) Write one method of preparation of isocyanide. Give one application of it.
- (c) How are nitroalkanes prepared from alkanes and haloalkanes? Write the reactions involved.

(d) Complete the following reactions :



(e) Write two functions of alkaloids.

3. Answer any five from the following questions : 5×5=25

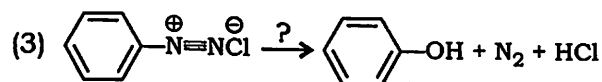
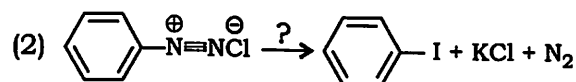
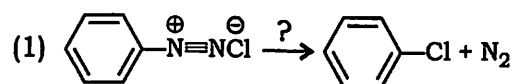
- (a) What are amines? Give examples. How will you distinguish among 1°, 2°- and 3°-amines? 1+1+3=5

(4)

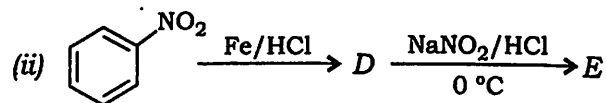
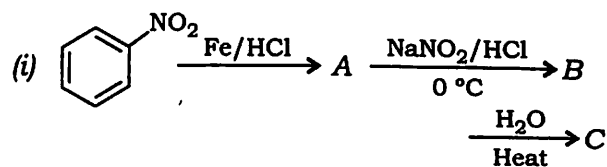
(b) Write one method each for the preparation of a primary, secondary and tertiary amine. What happens when ethylamine is treated with nitrous acid?
3+2=5

(c) (i) How will you prepare benzene diazonium chloride? 2

(ii) Suggest the reagent for the following conversions : 3



(d) Find A, B, C, D and E from the following reactions : 5



(5)

(e) Explain the structure of furan. How does furan react with (i) pyridine/SO₃ and (ii) H₂/Ni? 3+1+1=5

(f) Write Paal-Knorr synthesis of pyrrole. Explain why pyrrole is less basic than pyridine. 2+3=5

(g) What is turpentine oil? From where is it obtained? Write the general properties of terpenoids. 1+1+3=5

4. Answer any two from the following questions : 10×2=20

(a) Write short notes on the following : 2½×4=10

(i) Gabriel phthalimide synthesis

(ii) Mannich reaction

(iii) Carbylamine reaction

(iv) Hofmann elimination reaction

(b) (i) State the various points which are involved in explaining the structure of naphthalene. 5

(ii) Write Haworth synthesis of naphthalene preparation. 5

- (c) (i) Define alkaloid. 1
- (ii) Establish the structure of nicotine from its molecular formula. 5
- (iii) Write the medicinal importance of nicotine, quinine, morphine and reserpine. 4

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