63 (FY)SEM–5/MAJ/CHMMAJ3024

2025

CHEMISTRY

(Major)

Paper : CHMMAJ3024

(Organic Chemistry–2)

Full Marks : 50

Pass Marks : 20

Time : Two hours

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

1. Choose the correct answer from the following : 1×5=5

   (a) Which reagent is used to prepare alkyl isocyanides from alkyl halides ?

   (i) KCN

   (ii) $AgCN$

   (iii) $NaCN$

   (iv) NH_3

Contd.

(b) Which product forms when aniline reacts with bromine water ?

(i) Monobromoaniline

(ii) 2,4,6-tribromoaniline

(iii) Bromobenzene

(iv) *P*-bromoaniline only

(c) Which of the following is not a five membered ring ?

(i) Pyridine

(ii) Pyrrole

(iii) Furan

(iv) Thiophene

(d) Skraup synthesis is used to prepare

(i) Pyridine

(ii) Isoquinoline

(iii) Quinoline

(iv) Indole

(e) The group that is necessary for a coloured compound to act as a dye is known as—

(i) Chromogen

(ii) Chromophore

(iii) Auxochrome

(iv) Hypsochromic

2. Answer the following questions : ***(any five)*** 2×5=10

(a) Write *one* method of preparation of nitromethane. Write the reaction involved.

(b) Write *one* chemical reaction to distinguish between CH_3CN and CH_3NC.

(c) Out of pyrrole and furan, which is more aromatic ? Explain.

(d) Aniline is weaker base than ethylamine and ammonia. Explain.

(e) Write *one* method of preparation of pyrrole.

(f) Give an example of azo dye with structure.

(g) What is meant by the term R_f value? On what factors does the R_f value of a compound depend? 1+1=2

3. Answer the following questions : ***(any five)*** 5×5=25

(a) Distinguish between a primary, secondary and tertiary amine using Hinsberg's method.

(b) How is benzene diazonium chloride prepared in the laboratory? Starting from benzene diazonium chloride, how will you obtain *(i)* benzene *(ii)* phenol *(iii)* chlorobenzene.

(c) Write a short note 'Fisher indol synthesis'.

(d) How will you convert the following : 1×5=5

(i) Pyrrole to 2-nitropyrrole

(ii) Furan to furan-2-sulphonic acid

(iii) Thiophene to 2-benzoylthiophene

(iv) Pyridine to piperidine

(v) Pyridine to 2-aminopyridine

Write the reactions involved.

(e) (i) What is leuco base? How can it be converted into a dye? 2½

(ii) How will you synthesize alizarin from anthraquinone? 2½

(f) (i) Give the structural formula of the following : 2+2=4

Fluorescein and Congo Red

(ii) Give an example of edible dye. 1

(g) What is pinacol-pinacolone rearrangement? Explain its mechanism. 2+3=5

(h) What is Baeyer-Villiger rearrangement? Write its mechanism. 2+3=5

4. Answer the following questions : ***(any one)*** 10

(a) (i) Explain the electrophilic aromatic substitution reaction of pyrrole with examples. 5

(ii) Complete the following reactions : 1×3=3

(1) $ROH + H_2S \xrightarrow[400°C]{ThO_2}$

(2) $(CH_3CO)_2O + RSH \longrightarrow$

(3) $CH_3CH_2SH \xrightarrow{\text{Raney } Ni}$

(iii) Pyridine is basic. Explain. 2

(b) Write short notes on the following : ***(any two)*** 5×2=10

(i) Hofmann rearrangement

(ii) Beckmann rearrangement

(iii) Carbylamine reaction

(iv) Fries rearrangement
