

B.Sc. DEGREE EXAMINATION, APRIL 2022
BRANCH IV - CHEMISTRY
FOURTH SEMESTER

COURSE : MAJOR – CORE
PAPER : ORGANIC CHEMISTRY - II
TIME : 3 HOURS

MAX. MARKS : 100

SECTION – A

ANSWER ALL THE QUESTIONS.

(30x1=30)

I Choose the correct answer.

- Which of the following is the most basic compound?
(a) Ammonia (b) Methylamine (c) Dimethylamine (d) Tri methylamine
- Which one of the following acids decarboxylate to phenol?
(a) Phthalic acid (b) succinic acid (c) salicylic acid (d) malic acid
- Reaction between a carboxylic acid (RCOOH) with diazomethane (CH₂N₂) yield an/a
(a) Ester (b) Amide (c) Nitro Compound (d) Amine
- Which amine will not give the carbylamine test?
(a) p-methyl aniline (b) ethylamine (c) aniline (d) diethyl amine
- Aniline and ethylamine can be distinguished by
(a) HCl (b) H₂SO₄ (c) CH₃COCl (d) HNO₂
- Acetonitrile undergoes reaction with LiAlH₄ to form
(a) Methylamine (b) Dimethylamine (c) Ethylamine (d) Trimethylamine
- Arndt-Eistert reaction takes place through the formation of which intermediate?
(a) Carbanion (b) Carbocation (c) Nitrene (d) Ketene
- Acid chlorides are reduced with lithium aluminium hydride to give
(a) Aldehyde (b) Alcohols (c) ketones (d) carboxylic acids
- Halohydrins when treated with base form epoxides. This is an example of?
(a) S_N¹ reaction (b) Neighbouring group participation (c) S_N¹ (d) S_N²
- β –Hydroxy butyric acid on heating gives _____
(a) lactide (b) lactic acid (c) γ-lactone (d) crotonic acid

II Fill in the blanks:

- Benzene and acetic anhydride react in the presence of aluminium chloride to form _____
- _____ reagent is used as a test for unsaturation in cinnamic acid.
- Hinsberg's reagent is _____.

- 14 Oxidation of glycerol with sodium hypobromite gives_____.
- 15 α - Bromo butyric acid on treatment with aqueous KOH gives _____.
- 16 Ethylene glycol is used as a/an _____ .
- 17 Aromatic amine is identified by_____ test.
- 18 Enol form of ethyl acetoacetate is _____.
- 19 Primary amine heated with chloroform and alcoholic KOH gives_____.
- 20 The reagent used in Kolbe reaction is _____.

III State whether true or false:

- 21 $\text{CH}_3\text{CH}_2\text{NO}_2$ does not exhibit tautomerism.
- 22 Primary amine produces N_2 when treated with HONO.
- 23 Intermolecular hydrogen bonding not possible for o-nitro phenol.
- 24 Aniline reacts with NaNO_2/HCl at 0°C to yield Benzene diazonium chloride.
- 25 Reduction of Nitro benzene in neutral medium yield phenyl hydroxylamine.

IV Answer in a line or two:

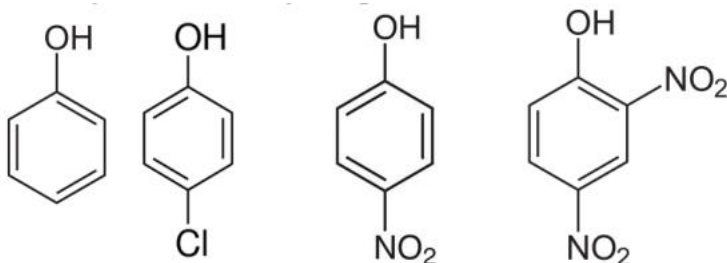
- 26 Suggest suitable reagent for the following conversion.
 $\text{RCOOCH}_3 \rightarrow \text{RCOOH} \rightarrow \text{RCOCl} \rightarrow \text{RCONH}_2$
- 27 Give the effect of electron releasing group on the acidity of phenoxide ion?
- 28 What is active methylene group?
- 29 Is p-nitroaniline less basic than aniline?
- 30 Phenols are more acidic than alcohols. Give reason.

Section – B

Answer any five questions.

(5 x 6 = 30)

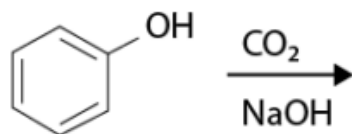
- 31 Arrange the following compounds in the order of increasing acidity. Give reasons.



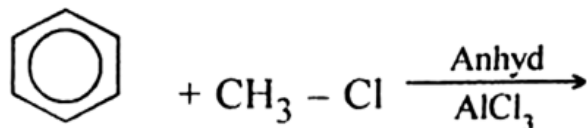
- 32 What is esterification reaction? Explain the hydrolysis of esters by AAC₂ mechanism (2+4)

33 Predict the product and give the mechanism. (3+3)

(a)



(b)



34 How will you effect the following transformation? (3+3)

- a) Methylamine to ethylamine
b) Ethylamine to Methylamine

35 Give the steps for the following conversions? (3+3)

- a) adipic acid from ethylene
b) glutaric acid from ethyl malonate

36 Explain the action of heat on hydroxy carboxylic acids.

37 Compound (A) $\text{C}_3\text{H}_6\text{O}_2$, when treated with excess of ammonia and then heated formed (B) $\text{C}_3\text{H}_7\text{NO}$. (B) when treated with P_2O_5 formed (C), $\text{C}_3\text{H}_5\text{N}$. (C) on complete acid-hydrolysis gave (A). (C) on reduction with lithium aluminium hydride formed a basic nitrogenous compound (D), $\text{C}_3\text{H}_9\text{N}$. (D) on treatment with nitrous acid formed an alcohol (E), $\text{C}_3\text{H}_8\text{O}$. (E) on oxidation formed compound (A). Give the structures of (A), (B), (C), (D) and (E), and show the reactions involved

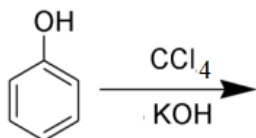
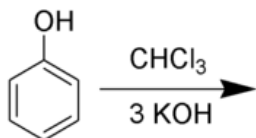
Section – C

Answer any two questions.

(2 x 20 = 40)

- 38 (a) Distinguish between primary, secondary and tertiary amines.
(b) Explain and arrange these compounds in the order of increasing boiling points. (12+8)
- (i) n-hexane (ii) 1-hexanol (iii) 2-methylpentanol (iv) 1-heptanol
(v) 2,2-dimethylbutanol

- 39 (a) Discuss the method of preparation of (10+4+6)
 (i) Acrylic acid (ii) Succinic acid (iii) Malonic acid
 (iv) Crotonic acid.
 (b) Explain Tautomerism reaction with an example.
 (c) Identify and give mechanisms of the given reaction.



- 40 (a) What is coupling reaction? Why coupling with phenol is carried out (2+4)
 in weakly alkaline medium and with amines in weakly acidic (10)
 medium?
 (b) Starting from Benzene diazonium Chloride prepare (4)
 i) Phenol ii) benzene iii) Fluorobenzene iv) nitrobenzene
 (c) Give the synthetic application and preparation of Acetoacetic ester.

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