ORGANIC PROBLEM

20X3=60

ANSWER THE FOLLOWING. FIND A, B, C.

1. C_6H_6O (A) $\xrightarrow{NH3}$ (B) (A) $\xrightarrow{Zn}$ (C)
2. C_7H_6O (A) $\xrightarrow{50\%\ NaOH}$ (B) C_7H_8O + $C_7H_5O_2Na$ (C). (C) $\xrightarrow{HCl}$ (D) $\xrightarrow{Sodalime}$ (E)
3. C_2H_6O (A) $\xrightarrow{\text{conc. } H_2SO_4 \text{ at } 443\ K}$ (B) $\xrightarrow{Bayer's\ reagent}$ (C) $C_2H_6O_2$ $\xrightarrow{\text{anhydrous } ZnCl_2}$ C_2H_4O (D)
4. CH_4O (A) $\xrightarrow{Tollens\ reagent}$ (B) CH_2O $\xrightarrow{CH3MgBr}$ (C) C_2H_6O
5. C_2H_6O (A) $\xrightarrow{Cu/573K}$ (B) C_2H_4O $\xrightarrow{CH3MgBr}$ (C) C_3H_8O $\xrightarrow{Cu/573k}$ (D) C_3H_6O
6. C_6H_5Cl (A) $\xrightarrow{NaOH}$ (B) C_6H_6O $\xrightarrow{NH3—anhydrous\ ZnCl2}$ (C) C_6H_7N
7. C_6H_5Cl (A) $\xrightarrow{NaOH}$ (B) C_6H_6O $\xrightarrow{NaOH}$ (C) C_6H_5ONa $\xrightarrow{CO2}$ (D) $C_7H_6O_3$
8. $C_6H_5N_2Cl$ (A) $\xrightarrow{H2O}$ (B) C_6H_6O $\xrightarrow{Zn}$ (C) simplest aromatic hydrocarbon $\xrightarrow{Methyl\ chloride}$ (D) C_7H_8
9. C_6H_6 (A) $\xrightarrow{H3PO4\ 523\ K}$ (B) C_9H_{12} $\xrightarrow{Air\ O2}$ (C) $C_9H_{12}O_2$ $\xrightarrow{H2SO4}$ (D) C_6H_6O
10. C_3H_8O (A) $\xrightarrow{P/I2}$ (B) C_3H_7I $\xrightarrow{AgNO2}$ (C) $C_3H_7NO_2$ $\xrightarrow{Nitrous\ acid}$ (D) $C_3H_6N_2O_3$ Blue colour
11. C_2H_6O (A) $\xrightarrow{Al2O3/620K}$ (B) alkene $\xrightarrow{Bayer's\ reagent}$ (C) $C_2H_6O_2$
12. C_6H_6O (A) $\xrightarrow{CHCl3\ and\ NaOH}$ (B) $C_7H_6O_2$ (A) $\xrightarrow[Anhydrous\ chloride]{NH3}$ (C) C_6H_7N
13. Organic compound (A) $\xrightarrow{reduction}$ (B) $\xrightarrow{CHCl3\ alc\ KOH}$ (C) $\xrightarrow{catalytic\ reduction}$ (D) N – methyl aniline
14. C_3H_4 (A) $\xrightarrow{Hg2+\ /\ H2SO4}$ (B) (Positive iodoform test) $\xrightarrow{NH2-NH2\ /\ C2H5ONa}$ (C)
    (B) $\xrightarrow{HCHO\ /dil\ NaOH}$ (D)
15. $C_3H_8O_3$ (A) $\xrightarrow{Fenton's\ reagent}$ (B) and (C)
16. C_7H_7NO (A) $\xrightarrow{Br2\ and\ KOH}$ (B) $\xrightarrow{diazotization}$ (C) $\xrightarrow{coupling\ with\ p-cresol}$ (D)
17. C_2H_4O (A) $\xrightarrow{Methanol/HCl}$ (B) $C_4H_{10}O_2$ (A) $\xrightarrow{Methanal\ in\ the\ presence\ of\ dilute\ NaOH}$ (C) $C_3H_6O_2$
18. C_2H_5Br (A) $\xrightarrow[dry\ ether]{Mg}$ (B) $\xrightarrow{CO2}$ (C)
19. (A) $\xrightarrow{Sn/HCl}$ (B) C_6H_7N $\xrightarrow{Benzoyl\ chloride\ /pyridine}$ (C) (B) $\xrightarrow{CH3Br}$ (D) $\xrightarrow{NaNO2/HCl}$ (E)
20. C_2H_6O (A) $\xrightarrow{Con\ H2SO4\ at\ 443K}$ (B) C_2H_4 $\xrightarrow{Bayer's\ reagent}$ $C_2H_6O_2$ (C). (A) $\xrightarrow[413\ K]{Conc\ H2SO4}$ $C_4H_{10}O$ (E).

ALL THE BEST SCORE CENTUM MARKS

Organic Problems (A,B,C Problems)

Answer key:-

1. $A \rightarrow C_6H_5OH \rightarrow$ Phenol, $C_6H_5OH \xrightarrow{NH_3} C_6H_5NH_2 \rightarrow$ Aniline
(A) (B)

$C_6H_5OH \xrightarrow{Zn} C_6H_6 \rightarrow$ Benzene
(A) (C)

Ans:
$A \rightarrow C_6H_5OH \rightarrow$ Phenol
$B \rightarrow C_6H_5NH_2 \rightarrow$ Aniline
$C \rightarrow C_6H_6 \rightarrow$ Benzene

2. $A \rightarrow C_7H_6O \rightarrow C_6H_5CHO \rightarrow$ Benzaldehyde

$C_6H_5CHO + C_6H_5CHO \xrightarrow{50\% NaOH} C_6H_5CH_2OH$ (B) + C_6H_5COONa (C) } Cannizaro reaction
(A)

$C_6H_5COONa \xrightarrow{HCl} C_6H_5COOH + NaCl$
(C) (D)

$C_6H_5COOH + NaOH \xrightarrow[\Delta]{CaO} C_6H_6 + CaCO_3$
(D) (E)

Ans:
$A \rightarrow C_6H_5CHO \rightarrow$ Benzaldehyde
$B \rightarrow C_6H_5CH_2OH \rightarrow$ Benzyl alcohol
$C \rightarrow C_6H_5COONa \rightarrow$ Sodium benzoate
$D \rightarrow C_6H_5COOH \rightarrow$ Benzoic acid
$E \rightarrow C_6H_6 \rightarrow$ Benzene.

3. & 20. $A \rightarrow C_2H_5OH$

$C_2H_5OH \xrightarrow[\text{at } 443K]{\text{Conc.}H_2SO_4} CH_2=CH_2 \xrightarrow[\text{reagent}]{\text{Bayer's}} CH_2(OH)-CH_2(OH) \xrightarrow[ZnCl_2]{\text{anhydrous}} CH_3CHO$
(A) (B) (C) (D)

→ Cold dilute alkaline $KMnO_4$.

Ans: $A \rightarrow C_2H_5OH \rightarrow$ Ethanol

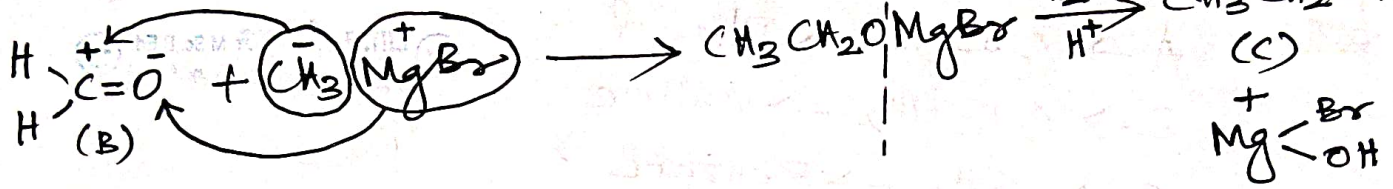
$C_2H_5OH \xrightarrow[413K]{\text{Conc.}H_2SO_4} CH_3CH_2OCH_2CH_3$
(A) (E)

B → $CH_2=CH_2$ → Ethylene

C → $CH_2(OH)-CH_2(OH)$ → Ethane-1,2-diol

D → CH_3CHO → Ethanal, E → $C_2H_5OC_2H_5$ → Ethoxy Ethane

4. CH_3OH (A) $\xrightarrow{\text{Tollen's reagent}}$ HCHO (B)



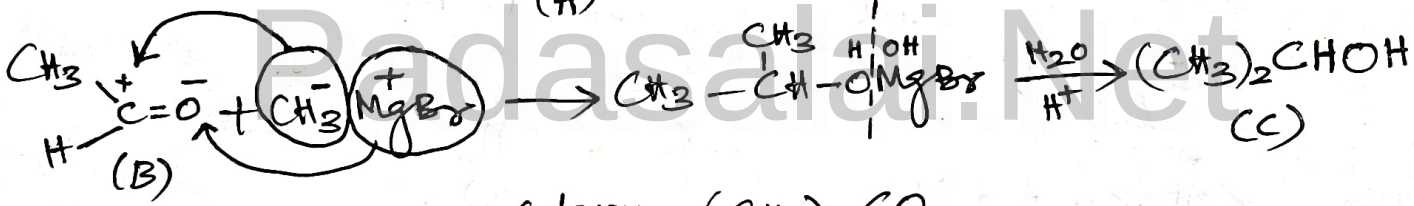
Ans:

A → CH_3OH → Methanol

B → HCHO → Methanal

C → CH_3CH_2OH → Ethanol.

5. A → C_2H_5OH, C_2H_5OH (A) $\xrightarrow{Cu/573K}$ CH_3CHO (B)



$(CH_3)_2CHOH$ (C) $\xrightarrow{Cu/573K}$ $(CH_3)_2CO$ (D)

Ans:

A → C_2H_5OH → Ethanol

B → CH_3CHO → Ethanal

C → $(CH_3)_2CHOH$ → Propan-2-ol

D → $(CH_3)_2CO$ → Propanone

6. C_6H_5Cl (A) $\xrightarrow{NaOH}$ C_6H_5OH (B) $\xrightarrow[\text{anhydrous } ZnCl_2]{NH_3/\Delta}$ $C_6H_5NH_2$ (C)

Dow's Process.

Ans:

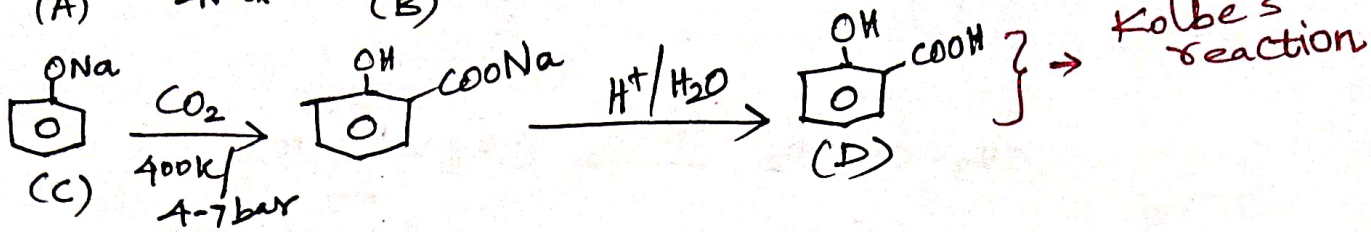
A → C_6H_5Cl → Chlorobenzene

B → C_6H_5OH → Phenol

C → $C_6H_5NH_2$ → Aniline

7. Dow's process

C_6H_5Cl (A) $\xrightarrow[-NaCl]{NaOH}$ C_6H_5OH (B) $\xrightarrow{NaOH}$ C_6H_5ONa

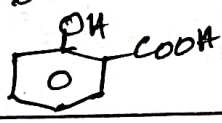


Ans:

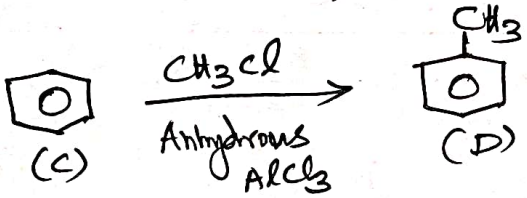
A → C_6H_5Cl → Chloro benzene

B → C_6H_5OH → Phenol

C → C_6H_5ONa → Sodium Phenoxide

D →  → Salicylic acid

8. $C_6H_5N_2Cl$ (A) $\xrightarrow{H_2O}$ C_6H_5OH (B) $\xrightarrow{Zn}$ C_6H_6 (C) → simplest aromatic hydrocarbon



→ Friedel crafts Alkylation reaction.

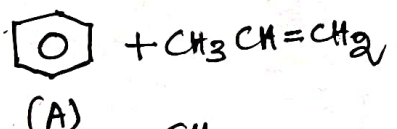
Ans:

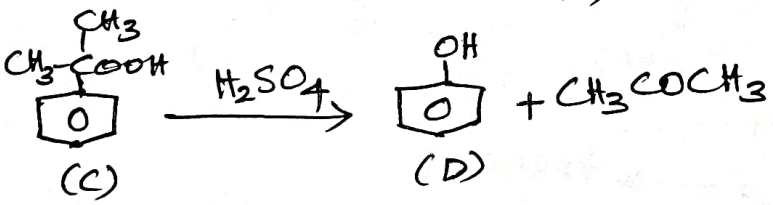
A → C_6H_5Cl → Chloro benzene

B → C_6H_5OH → Phenol

C → C_6H_6 → Benzene

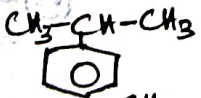
D → $C_6H_5CH_3$ → Toluene

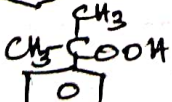
9. A →  (A)



Ans:

A →  → Benzene

B →  → Cumene

C →  → Cumene hydro Peroxide

D →  → Phenol

10. $A \rightarrow CH_3-\underset{\underset{OH}{|}}{CH}-CH_3 \xrightarrow{P/I_2} CH_3-\underset{\underset{I}{|}}{CH}-CH_3 \xrightarrow{AgNO_2} CH_3-\underset{\underset{NO_2}{|}}{CH}-CH_3$

(B) (C)

$CH_3-\underset{\underset{CH_3}{|}}{CH}-NO_2 \xrightarrow{HONO} CH_3-\underset{\underset{NO}{|}}{\overset{\overset{CH_3}{|}}{C}}-NO_2$

(C) (Blue Colour) (D)

Ans:

$A \rightarrow CH_3-\underset{\underset{OH}{|}}{CH}-CH_3 \rightarrow$ Propan-2-ol

$B \rightarrow CH_3-\underset{\underset{I}{|}}{CH}-CH_3 \rightarrow$ 2-Iodo Propane

$C \rightarrow CH_3-\underset{\underset{NO_2}{|}}{CH}-CH_3 \rightarrow$ 2-Nitro Propane

$D \rightarrow CH_3-\underset{\underset{NO_2}{|}}{\overset{\overset{NO}{|}}{C}}-CH_3 \rightarrow$ 2-Nitro-2-Nitroso propane.

11. $A \rightarrow CH_3CH_2OH \xrightarrow[620K]{Al_2O_3} CH_2=CH_2 \xrightarrow{\text{Bayer's reagent}} \underset{\underset{OH}{|}}{CH_2}-\underset{\underset{OH}{|}}{CH_2}$

(B) (C)

Ans:

$A \rightarrow CH_3CH_2OH \rightarrow$ Ethanol

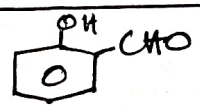
$B \rightarrow CH_2=CH_2 \rightarrow$ Ethene

$C \rightarrow \underset{\underset{OH}{|}}{CH_2}-\underset{\underset{OH}{|}}{CH_2} \rightarrow$ Ethane-1,2-diol.

12. $A \rightarrow C_6H_5OH$,

(A)

$\xrightarrow[NaOH]{CHCl_3}$



(B) → Reimer-Tiemann reaction

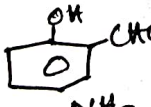
(A)

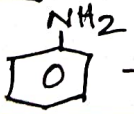
$\xrightarrow[\text{anhydrous } ZnCl_2]{NH_3/\Delta}$

(C)

Ans:-

$A \rightarrow$  → Phenol

$B \rightarrow$  → Salicylaldehyde.

$C \rightarrow$  → Aniline

13. $A \rightarrow C_6H_5NO_2 \xrightarrow[6[H]]{Sn/HCl} C_6H_5NH_2$ (B)

Carbylamine reaction

$C_6H_5NH_2 \xrightarrow[3KOH]{CHCl_3} C_6H_5NC \xrightarrow[(or)\ Ni/H_2]{Na/C_2H_5OH} C_6H_5NH-CH_3$

(B) (C) (D)

Ans:

A → $C_6H_5NO_2$ → Nitro benzene

B → $C_6H_5NH_2$ → Aniline

C → C_6H_5NC → Phenyl carbylamine

D → $C_6H_5NHCH_3$ → N-methyl aniline

14. $A \longrightarrow CH_3C{\equiv}CH \xrightarrow[H_2O]{Hg^{2+}, HgSO_4} CH_3COCH_3$ (B)

CH_3COCH_3 (B) $\xrightarrow[NaOH]{3I_2} CI_3COCH_3 \xrightarrow{NaOH} CHI_3 + CH_3COONa$ } Iodoform reaction

↳ Positive Iodoform Test.

CH_3COCH_3 (B) $\xrightarrow[C_2H_5ONa]{N_2H_4}$ $CH_3CH_2CH_3$ (C) ⇒ Wolff-Kishner reduction

CH_3COCH_3 (B) $\xrightarrow[dil.NaOH]{HCHO}$ $CH_2(OH)-CH_2COCH_3$ (D) → crossed Cannizzaro reaction

Ans:

A → $CH_3C{\equiv}CH$ → Prop-1-yne

B → CH_3COCH_3 → Propanone

C → $CH_3CH_2CH_3$ → Propane

D → $CH_2(OH)-CH_2COCH_3$ → 4-hydroxybutan-2-one

15. $A \longrightarrow$ Glycerol $\xrightarrow{\text{Fenton's reagent } (FeSO_4 + H_2O_2)}$ Glyceraldehyde (B) + Dihydroxyacetone (C)

mixture → Glycerose

Ans:

A → Propan-1,2,3-diol

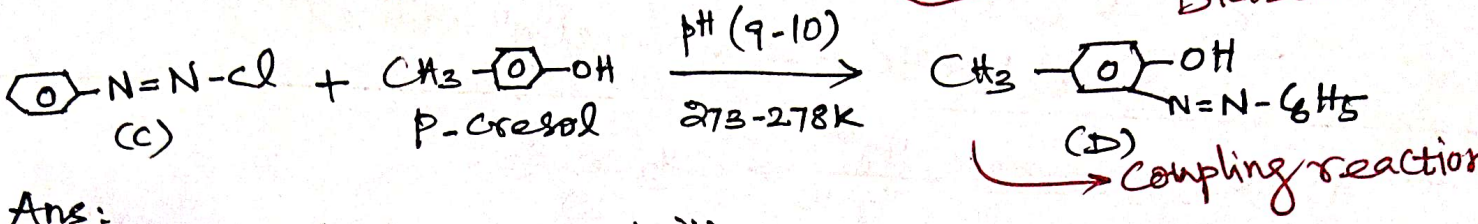
B → 2,3-dihydroxy Propanal

C → 1,3-dihydroxy Propan-2-one.

16. $A \rightarrow C_6H_5CONH_2 \xrightarrow{Br_2/KOH} C_6H_5NH_2 \xrightarrow[9HCl]{NaNO_2} C_6H_5N_2Cl$

(B) (C)

↳ Hoffman Bromamide reaction; 273-278K; Diazotisation

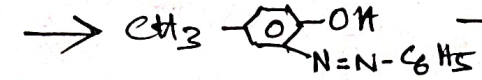


Ans:

B → $C_6H_5NH_2$ → Aniline

A → $C_6H_5CONH_2$ → Benzamide

C → $C_6H_5N_2Cl$ → Benzene diazonium Chloride

D →  → 2-phenylazo-4-Methyl Phenol

18. $A \rightarrow C_2H_5Br \xrightarrow[dry\ ether]{Mg} C_2H_5MgBr$ (B)

$C_2H_5MgBr + CO_2 \xrightarrow[ether]{dry} C_2H_5COOMgBr \xrightarrow[H^+]{H_2O} C_2H_5COOH + Mg\langle^{Br}_{OH}$

(B) (C)

Ans:

A → C_2H_5Br → Bromoethane

B → C_2H_5MgBr → Ethyl magnesium Bromide

C → C_2H_5COOH → Propanoic acid

19. $A \rightarrow C_6H_5NO_2 \xrightarrow{Sn/HCl} C_6H_5NH_2$ (B) $\xrightarrow[Pyridine]{C_6H_5COCl} C_6H_5NHCOC_6H_5$ (C) → Schotten Baumann reaction

$C_6H_5NH_2$ (B) $\xrightarrow{CH_3Br} C_6H_5NHCH_3$ (D) ; $C_6H_5NH_2$ (B) $\xrightarrow[HCl]{NaNO_2} C_6H_5N_2Cl$ (E)

↳ Diazotisation

Ans:

A → $C_6H_5NO_2$ → Nitrobenzene

B → $C_6H_5NH_2$ → Aniline

C → $C_6H_5NHCOC_6H_5$ → N-Phenyl benzamide

D → $C_6H_5NH-CH_3$ → N-methyl Aniline

E → $C_6H_5N_2Cl$ → Benzene diazonium Chloride

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