Q. P. Code: 35625

(3 Hours) **Total Marks: 70**

N.B.: 1. All questions are compulsory
2. Figures to right indicate full marks

Q1) A] **Answer the following questions**

a) Explain terms : Dihedral angle , Conformation, Ring Flipping , 1,3-diaxial interaction **(4M)**

b) Draw all possible resonating structures of Anthracene and Phenenanthrene **(2M)**

(c) **Give identification test for** **(3 M)**

i) An alcohol ii) Carboxylic acid iii) Aromatic primary amine

C] **Give the products for the following reactions (Any six)** **(6 M)**

i) p-Nitrobenzaldehyde $\xrightarrow{\text{Strong NaOH}}$

ii) Anthracene $\xrightarrow{\text{Na, EtOH}}$

iii) 2 Moles of Benzaldehyde $\xrightarrow{\text{Aq. alc. KCN}}$

iv) Ethyl benzoate $\xrightarrow{\text{Aq. NaOH}}$

v) CH_3CH_2COCl + t-BuOH $\longrightarrow$

vi) $C_6H_5NH_2 + C_6H_5COCl \longrightarrow$

vii) $CH_3COOH \xrightarrow[\text{ii) } H_2O]{\text{i) } HN_3}$

Q2) A] Give the mechanism of **any two** rearrangements of the following **(4 M)**

i) Steven alkylation ii) Favorski rearrangement

iii) Hoffman rearrangement

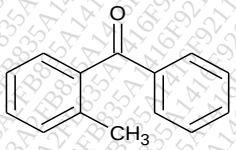
B] Complete the following reactions **(3 M)**

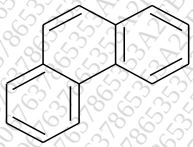
i) $C_6H_5CH{=}CHCH_2OH \xrightarrow[EtOH]{\text{Raney Ni/ } H_2}$

ii) $C_6H_5COCH_3 \xrightarrow[CHCl_3]{CF_3CO_3H}$

iii) $C_6H_5COCl \xrightarrow{NaBH_4}$

C] Identify A, B, C and D **(4 M)**

i)  $\xrightarrow{\text{Pyrolysis, 450 Deg. C}}$ A $\xrightarrow{HNO_3\text{, Acetic anhydride}}$ B

ii)  $\xrightarrow[H_2SO_4]{K_2Cr_2O_7}$ C $\xrightarrow{CuO\ Cr_2O}$ D

Q3)A] Draw conformers of n-butane and arrange them in the order of relative stability **(2 M)**

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B] Draw neatly the cis and trans conformers of cyclohexane-1,2-diol and briefly discuss stability for them **(3 M)**

C] Attempt the following conversions (Any three) **(6 M)**

i) Benzoic acid to phenylacetic acid ii) Salicylic acid to catechol

iii) o—Methylbenzophenone to anthracene iv) Phenol to ethylphenyl ether

Q4) A] Discuss any two methods of preparation of carboxylic acid **(4 M)**

B] Write structure of products formed

i) When naphthalene is reacted with **(3 M)**

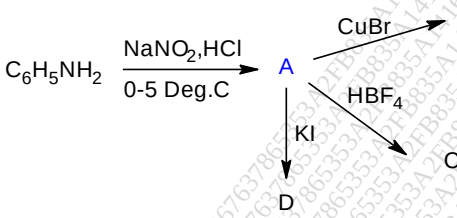
a) Na+ Ethanol b) O2/ V2O5, Heat, c) H2, Ni, 200°

ii) Which product gets formed when beta-napthol reacts with benzene diazonium chloride in cold **(1 M)**

C] Give detailed mechanism for alkaline hydrolysis of ester **(3 M)**

Q5) A] Explain electrophilic substitution on phenol with respect to activation of ring and orientation. Cite example of nitration and bromination **(4 M)**

B] Suggest products for following **(4 M)**



C] A molecule $C_4H_8O_2$(A) on treatment with thionyl chloride gives C_4H_7ClO (B). This on treatment with ethyl alcohol in presence of H+ gives $C_5H_{812}O_2$ (C). C on hydrolysis reverts back to product A. Write structures for A, B and C **(3 M)**

Q6)A] Give mechanisms for the following (Any 2) **(4 M)**

i) Reformatsky reaction ii) Claisen condensation iii)Beckman alkylation

B] Give any three methods for the preparation of alcohols **(3 M)**

C] A hasty chemist forgot to label the containers and now wants to use basics in organic chemistry to solve the problem. He has four containers namely A,B, C and D and wants to identify which of them contains propionic acid, benzamide, o-toludine and acetophenone. He carried out following four reactions to arrive at conclusion:

Container A: Compound+ NaOH , boil and smell of ammonia

Container B: Added $NaHCO_3$ to compound and observed a brisk effervescence

Container C: Added 2,4-DNP and observed thick orange precipitate

Container D: Compound in Conc.HCl+ NaNO2 in HCl at 0-5 deg.C , mix and add beta-nappthol in NaOH gave orange dyestuff. Identify Contents of container A,B, C and D **(4 M)**

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