16117

3 Hours / 100 Marks   Seat No. ☐☐☐☐☐☐☐☐

Instructions : (1) All Questions are *compulsory*.

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

(7) Preferably, write the answers in sequential order.

Marks

1.   **Answer any TEN of the following :**   **10 × 2 = 20**

(a) Explain nomenclature of aromatic hydrocarbons.

(b) State any two applications of benzene.

(c) Write balanced reaction for nitration of chlorobenzene.

(d) Write any two physical properties of benzene sulphonic acid.

(e) Give reaction for reduction of nitrobenzene in acidic and alkaline medium.

(f) State any two commercial uses of nitrobenzene.

(g) Give four examples of aromatic amines.

(h) Write balanced reaction for bromination of aniline.

(i) Write precautions to be taken in conducting diazotization.

    (j)   Write reaction for conversion of chlorobenzene to phenol.

    (k)   Write structure of 4-amino, –3, 5– dibromobenzoic acid.

    (l)   What is fused ring ? Give any two examples.

    (m)   Write resonating structure for naphthalene.

    (n)   State applications of substituted aromatic hydrocarbons in dye manufacturing.

2.   **Attempt any FOUR of the following :**   **4 × 4 = 16**
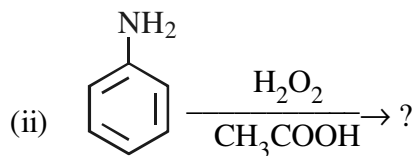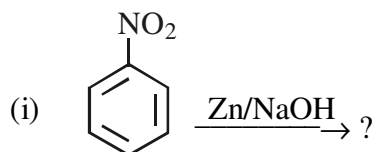
    (a)   Differentiate aliphatic compound and aromatic compounds. (any four points)

    (b)   Define coal tar. List out different products obtained on fractional distillation of coal – tar.

    (c)   Write reactions and reaction conditions of benzene for its :

        (i)   Nitration

        (ii)   Sulphonation

    (d)   What is action of chlorine on toluene in presence of UV light and iron catalyst ? Explain.

    (e)   Write any four physical properties of toluene.

    (f)   How will you prepare chlorobenzene from aniline ? Name the reaction.

3.   **Attempt any FOUR of the following :**   **4 × 4 = 16**

    (a)   Write any four industrial applications of chlorobenzene.

    (b)   Explain a method for preparation of benzene sulphonic acid with balanced reaction.

    (c)   List any four uses of benzene sulphonic acid.

    (d)   State physical properties of nitrobenzene. Comment on its odour.

(e) Predict the products in the following reaction :

(i)

$$\text{C}_6\text{H}_5\text{NO}_2 \xrightarrow{\text{Zn/NaOH}} ?$$

(ii)

$$\text{C}_6\text{H}_5\text{NH}_2 \xrightarrow[\text{CH}_3\text{COOH}]{\text{H}_2\text{O}_2} ?$$

Write conditions involved in the reactions.
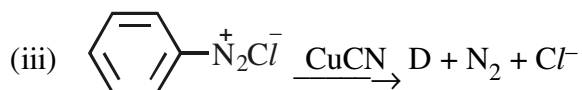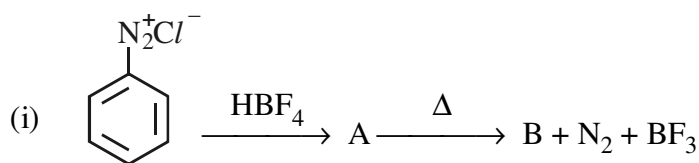
(f) How will you prepare aniline from following ?

(i) Nitrobenzene   (ii) Chlorobenzene

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4. Answer any FOUR of the following :   **4 × 4 = 16**

(a) (i) Write boiling point of pure aniline. Comment on its odour.

   (ii) State applications of aniline.

(b) Write any four applications of aniline.

(c) How is benzene diazonium chloride prepared in laboratory ? Give balanced reaction.

(d) List industrial applications of benzene diazonium chloride.

(e) Predict A, B, C & D in the following reactions :

(i)

$$\text{C}_6\text{H}_5\text{N}_2^+Cl^- \xrightarrow{\text{HBF}_4} A \xrightarrow{\Delta} B + N_2 + BF_3$$

(ii)

$$\text{C}_6\text{H}_5-\overset{+}{N}_2Cl^- + \text{C}_6\text{H}_5-OH \xrightarrow[\text{alkaline}]{\text{weak}} C + HCl$$

(iii)

$$\text{C}_6\text{H}_5-\overset{+}{N}_2Cl^- \xrightarrow{\text{CuCN}} D + N_2 + Cl^-$$

(f) (i) Write any two physical properties of phenol.

   (ii) Explain acidity of phenol.

5. Answer any FOUR of the following : **4 × 4 = 16**

(a) Explain preparation of phenol from cumene. Write balanced reactions involved.

(b) Explain applications of phenol in preparation of dye intermediates.

(c) Draw structures for the following compounds :

    (i) p-nitrobenzoic acid

    (ii) salicylic acid

    (iii) m-amino benzoic acid

    (iv) p-methoxy benzoic acid

(d) Explain following chemical properties of benzoic acid :

    (i) salt formation

    (ii) ester formation

(e) List any four applications of benzoic acid.

(f) Explain coal tar distillation for preparation of naphthalene.

6. Answer any FOUR of the following : **4 × 4 = 16**

(a) Explain with reaction, hydroxylation of naphthalene.

(b) Enlist any four physical properties of anthracene.

(c) Explain with reaction :

    (i) Chlorination –

    (ii) Sulphonation – of anthracene.

(d) Describe with reactions, preparation of anthracene.

(e) Write resonating structures of anthracene.

(f) State evidences of fused rings in preparation of dye intermediates.

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