902

B.Sc. (Hons.)/I   C

CHEMISTRY—Paper II

(Organic Chemistry)

Time : 3 *Hours*   *Maximum Marks* : 38

(Write your Roll No. on the top immediately on receipt of this question paper.)

Attempt *six* questions in all.

Question No. 1 carries *eight* marks.

1. A primary alkyl bromide (A), C_4H_9Br, reacted with hot alcoholic KOH to give compound (B). Compound (B) reacted with hydrogen bromide to give an isomer of (A), (C). When (A) was reacted with sodium, it gave compound (D) H_8H_{18}, which was different than the compound produced when *n*-butyl bromide was reacted with sodium. Draw the structure of (A), (B), (C) and (D). Write all equations for all the reaction.   8
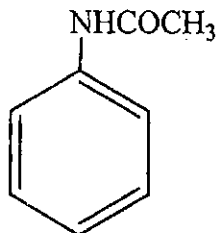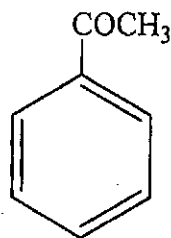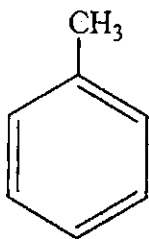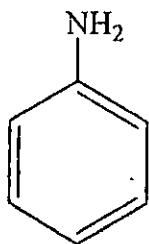
2. Explain the following :   2×3=6

(a) Alkyl halides are more reactive towards nucleophilic substitution reaction than aryl halide.

(b) Chlorine is more reactive while bromine is more selective in halogenation of alkanes.

(c) Arrange the following in increasing order of reactivity towards ring bromination. Give reasons for your answer :

3. (a) Discuss the stereochemistry of addition of bromine to E-But-2-ene.

    (b) In electrophilic substitution reaction. nitrobenzene reacts very slowly while phenols react faster than benzene. Explain.

    (c) What is Baeyer's Strain Theory ?   2×3=6

4. Carry out the following conversions (any *three*) :   2×3=6

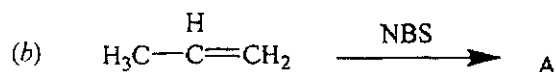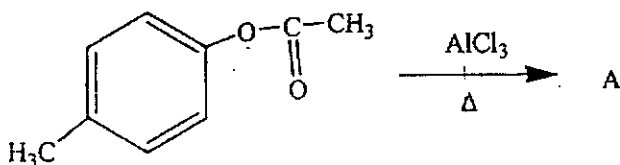   (a) p-bromobenzoic acid from benzene

    (b) tert. Butyl alcohol from propyne
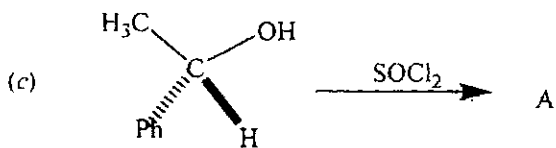
    (c) 2, 3-dimethylbutane from propane
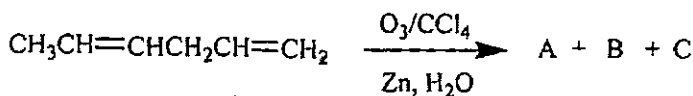
    (d) 2-butanone from ethyne.

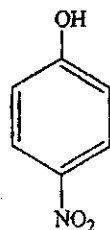5. Complete the following reaction :   6

    (a)

    (b) $H_3C - \overset{H}{C} = CH_2$ $\xrightarrow{\text{NBS}}$ A

(c)

$$H_3C \overset{OH}{\underset{Ph \quad H}{C}} \xrightarrow{SOCl_2} A$$

(d)

$$CH_3CH\equiv CH \xrightarrow[HgSO_4]{dil.\ H_2SO_4} A$$

(e)

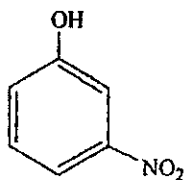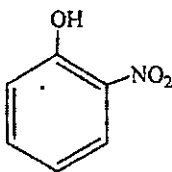$$CH_3CH=CHCH_2CH=CH_2 \xrightarrow[Zn,\ H_2O]{O_3/CCl_4} A + B + C$$
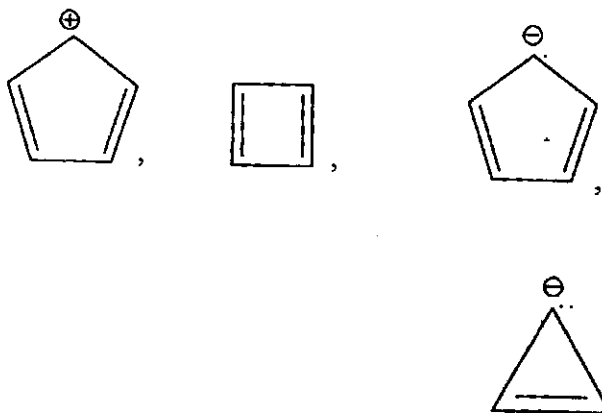
6.   (a)   Both meta and ortho-bromo anisole yield the same

product upon reaction with sodamide in presence of

ammonia. Explain.

(b)   Arrange the following in ascending order of acidity. Give

reasons for your answer :

(c) Classify the following compounds as aromatic and non-aromatic. Justify your answer with suitable reason : 2×3=6

7. (a) Calculate the relative amounts of all the monochlorinated propanes obtained from the chlorination of propane. The relative reactivities of $1° : 2° : 3°$ H'S to chlorination is $1 : 3.8 : 5.0$. Give IUPAC names of the products.

(b) Why does propene react with HBr in presence of peroxide to give 1-bromopropane whereas in absence of peroxide it gives 2-bromopropane ?

(c) How would you distinguish between :

    (i)   1-butyne and 2-butyne

    (ii)   2-butanol and ethanol.   3×2=6

8. Write short notes on (any *three*) :

    (a)   Diels-Alder reaction

    (b)   Friedel-Craft alkylation

    (c)   Octane number and Cetane number

    (d)   Reimer-Tiemann reaction.   3×2=6