

ESKPXII-XXVI (I)
CHEMISTRY PART-II

Time: 2 Hours 40 Minutes

SECTION "B"

Marks: 40

Note. Give short answers to any TEN (10) questions. All questions carry equal marks.

- Q.1.** Define electrical conductivity. Why do ionic oxides not conduct electricity in solid state? Why do they conduct electricity only in molten state? 1+1.5+1.5
- Q.2.** Write the complete and balanced chemical reactions of the following with water. Also mention the nature of product formed in each case. 1+1+1+1
- i). dichlorine heptoxide ii). sodium oxide iii). phosphorus trichloride iv). Sulphur dioxide
- Q.3.** What is the polarizing power of cation? Explain the two factors that affect it. How does the polarizing power of cation affect the stability of nitrates and hydrogen carbonates down the group? 1+1+2
- Q.4.** Define the following and give their uses: 1+1+1+1
- i. destructive distillation of coal
ii. fractional distillation of coal tar
iii. Hydrogenolysis of CO
iv. Ammoniacal liquor
- Q.5.** Give structures of the following: 1+1+1+1
- i. 3, 3-dimethylpentane
ii. 4-isopropyl-3-methylheptane
iii. 1-ethyl-2-methylcyclopentane
iv. 1, 2-dimethylcyclopentane
- Q.6.** Define ozonolysis of alkene. Write the reaction of ethene with ozone. Why is this reaction used? 1+2+1
- Q.7.** Write the reaction of methylmagnesium bromide with the following. Also name the product formed in each case. 1+1+1+1
- i). ethanal ii). propanone iii). ethyl propanoate iv). carbon dioxide
- Q.8.** Prepare phenol from the following: 2+2
- i). sodium benzenesulphonate ii). aniline
- Q.9.** Using KMnO_4 as oxidizing agent, prepare: 2+2
- i). methanoic acid from methanol ii). ethanoic acid from ethanol
- Q.10.** Write the structural formulas of the following: 1+1+1+1
- i. glucose (open chain form)
ii. glucose (cyclic form)
iii. fructose (open chain form)
iv. fructose (cyclic form)
- Q.11.** Write the names and important uses of any four fractions of petroleum. 1+1+1+1
- Q.12.** Define NMR spectroscopy. What two types of information does it provide? Describe why NMR signals split into multiple peaks and what information is provided by this splitting. 1+1+2
- Q.13.** Discuss the importance of spectroscopy in quantitative analysis in four points. 1+1+1+1

SECTION "C"

Marks: 27

Note: Attempt any THREE (03) questions from the following. Each question carries equal marks.

- Q.14.** a) What is reducing agent? Describe the reaction between bromide ions with sulphuric acid. Explain how this reaction demonstrates the reducing nature of bromide ions. 1+2+2
- b) What is coordination number of a central metal ion? Give an example. Determine the coordination number of the central metal ion and expected geometry of the following coordination compounds: 1+1+1+1
- i). $[\text{Fe}(\text{CN})_6]^{4-}$ ii). $[\text{Pt}(\text{NH}_3)_2\text{Cl}_2]$
- Q.15.** a) What are alkynes? Write the complete and balanced chemical equations for the following: 1+2+2
- i). addition of HBr to ethyne ii). addition of HBr to propyne
- b) Give general pattern of E2 mechanism. Why do primary alkyl halides give this mechanism? Why does E2 mechanism follow second order kinetics? 2+1+1
- Q.16.** a) What are phenols? Explain the reaction of phenol with the following reagents. Also mention the name of products formed in each case. 1+2+2
- i). sodium metal ii). $\text{K}_2\text{Cr}_2\text{O}_7$
- b) Write the following balanced chemical equations. Also name the products formed. 2+2
- i). ozonolysis of trans-but-2-ene ii). hydration of propyne
- Q.17.** a) Define atomic absorption spectrophotometry. Draw a schematic diagram of atomic absorption spectrophotometer and label it. 1+2+2
- b) Define ozone and state its location in the atmosphere. Describe the mechanism of production of ozone in the stratosphere. 1+1+2