123

I

Total No. of Questions—21

Total No. of Printed Pages—3 Regd. No. | | | | | | | | | | |

Part III

CHEMISTRY

Paper I

(English Version)

Time : 3 Hours ***Max. Marks : 60***

Note :— Read the following instructions carefully :

(*i*) Answer ALL the questions of Section A. Answer ANY SIX questions in Section B and ANY TWO questions in Section C.

(*ii*) In Section A, questions from Sr. Nos. **1** to **10** are 'very short answer type'. Each question carries TWO marks. Every answer may be limited to **2** or **3** sentences. Answer ALL these questions at one place in same order.

(*iii*) In Section B, questions from Sr. Nos. **11** to **18** are of 'short answer type'. Each question carries FOUR marks. Every answer may be limited to **75** words.

(*iv*) In Section C, questions from Sr. Nos. **19** to **21** are of 'long answer type'. Each question carries EIGHT marks. Every answer may be limited to **300** words.

(*v*) Draw labelled diagrams wherever necessary for questions in Section B and Section C.

SECTION A

10×2=20

Note :— Answer ALL questions.

1. Name the major particulate pollutants present in troposphere.

2. Why is KO_2 paramagnetic ?

3. What is closed system ? Give example.

4. Calculate kinetic energy (in SI units) of 4 g of Methane at –73°C.

5. What is PAN ? What effect is caused by it ?

6. Describe the important uses of Quicklime.

7. State Le-Chatelier's principle.

8. Define Normality.

9. State Hess law.

10. Write the I.U.P.A.C. names of the following compounds :

(*a*) $(CH_3)_3CCH_2C(CH_3)_3$

(*b*) $CH_2 = \underset{\displaystyle CH_3}{\overset{\displaystyle |}{C}}—CH_3$

SECTION B

6×4=24

Note :— Answer any SIX questions.

11. Define sp^2 Hybridisation. Explain the structure of Ethylene (C_2H_4).

12. Write the postulates of kinetic molecular theory of gases.

13. How does Diborane react with the following :

(*a*) CO

(*b*) NH_3.

14. What is meant by Bond order ? Calculate the bond orders in the following :

(*a*) N_2

(*b*) O_2^+.

15. A carbon compound contains 12.8% Carbon, 2.1% Hydrogen, 85.1% Bromine. The molecular weight of the compound is 187.9. Calculate the molecular formula.

16. Derive the relation between K_p and K_c for the equilibrium reaction :

$$N_{2(g)} + 3H_{2(g)} \rightleftharpoons 2NH_{3(g)}.$$

17. Write any *two* oxidising and *two* reducing properties of H_2O_2 with equations.

18. (*a*) SiF_6^{-2} is known while $SiCl_6^{-2}$ is not. Explain.

(*b*) Diamond has high melting point. Why ?

SECTION C

2×8=16

Note :— Answer any TWO questions.

19. What are Quantum Numbers ? Explain the significance of Quantum Numbers.

20. Define IE_1 and IE_2. Why $IE_2 > IE_1$ for a given atom ? Discuss the factors that affect IE of an element.

21. (*a*) Describe any *two* methods of preparation of Benzene with corresponding equations.

(*b*) How benzene reacts with the following :

(*i*) CH_3Cl/Anhy. $AlCl_3$

(*ii*) H_2/Ni.