123/TS

C

Total No. of Questions – 21

Total No. of Printed Pages - 2

Regd. No.

Part - III
CHEMISTRY, Paper-I
(English Version)

Time : 3 Hours] [Max. Marks : 60

Note : Read the following instructions carefully :

(i) Answer **all** 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 of "Very short answer type". Each question carries **two** marks. Every answer may be limited to **two** or **three** sentences. Answer all these questions at one place in the 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.

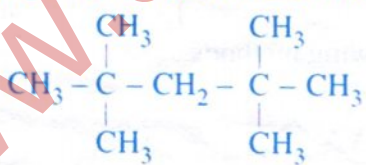
(v) Draw labelled diagrams wherever necessary for questions in Sections – **'B'** and **'C'**.

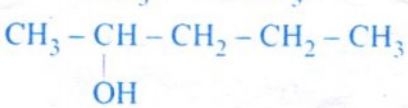
SECTION – A

$10 \times 2 = 20$

Note : Answer **all** the questions.

1. What is Green House effect ?
2. State Hess's Law of Constant Heat Summation.
3. Write IUPAC names of the following compounds :

(a) 

(b) 

4. Calculate the pH of 0.05 M H_2SO_4 solution.
5. Which of the gases diffuses faster among N_2, O_2 and CH_4 ? Why ?
6. Enthalpy of combustion of carbon to form CO_2 is -393.5 kJ mol^{-1}. Calculate the heat released upon formation of 35.2 g of CO_2 from carbon and dioxygen gas.

7. Calculate the oxidation number of oxygen in H_2O_2 and O_2F_2.
8. Why is gypsum added to cement ?
9. Name two adverse effects caused by acid rains.
10. What happens when magnesium metal is burnt in air ?

SECTION – B

$6 \times 4 = 24$

Note : Answer any **six** questions.

11. Deduce (a) Boyle's law (b) Graham's law from Kinetic gas equation.
12. Balance the following redox reaction by ion-electron method in acid medium :

$$MnO^-_{4(aq)} + SO_{2(g)} \longrightarrow Mn^{+2}_{(aq)} + HSO^-_{4(aq)}$$

13. Explain the structure of PCl_5 molecule with hybridization.
14. Discuss the application of Le-Chatelier's principle for the industrial synthesis of Ammonia.
15. Write ion-exchange method for the removal of hardness of water.
16. What is meant by the term Bond order ? Calculate the bond orders of the following :
    (a) N_2 (b) O_2
17. Explain the structure of diborane.
18. Give reasons for the following :
    (a) Graphite is a lubricant.
    (b) Diamond is an abrasive.

SECTION – C

$2 \times 8 = 16$

Note : Answer any **two** questions :

19. Write about four quantum numbers (n, *l*, m, s) and explain their significance.
20. What is a periodic property ? How the following properties vary in a group and in a period ?
    (a) Ionization Enthalpy
    (b) Electronegativity
    (c) Electron gain Enthalpy
21. (a) Write the preparation of ethane using the following methods :
    (i) Wurtz reaction
    (ii) Kolbe's electrolytic method
    (b) Complete the following reactions and name the products A, B, C, D :

(i) $CaC_2 \xrightarrow{H_2O} A \xrightarrow{\text{Hot metal tube}} B \xrightarrow[CH_3Cl]{AlCl_3} C$

(ii) Ethylene $\xrightarrow{Br_2/CCl_4} D$