

Total No. of Questions—21

Total No. of Printed Pages—3

Regd. No.

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**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  $\text{KO}_2$  paramagnetic ?

3. What is closed system ? Give example.
4. Calculate kinetic energy (in SI units) of 4 g of Methane at  $-73^{\circ}\text{C}$ .
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)  $(\text{CH}_3)_3\text{CCH}_2\text{C}(\text{CH}_3)_3$
  - (b)  $\text{CH}_2 = \underset{\text{CH}_3}{\text{C}} - \text{CH}_3$

### SECTION B

6×4=24

**Note** :— Answer any SIX questions.

11. Define  $sp^2$  Hybridisation. Explain the structure of Ethylene ( $\text{C}_2\text{H}_4$ ).
12. Write the postulates of kinetic molecular theory of gases.
13. How does Diborane react with the following :
  - (a) CO
  - (b)  $\text{NH}_3$ .
14. What is meant by Bond order ? Calculate the bond orders in the following :
  - (a)  $\text{N}_2$
  - (b)  $\text{O}_2^+$ .
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 :



17. Write any *two* oxidising and *two* reducing properties of  $\text{H}_2\text{O}_2$  with equations.
18. (a)  $\text{SiF}_6^{2-}$  is known while  $\text{SiCl}_6^{2-}$  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  $\text{IE}_1$  and  $\text{IE}_2$ . Why  $\text{IE}_2 > \text{IE}_1$  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)  $\text{CH}_3\text{Cl}/\text{Anhy. AlCl}_3$   
(ii)  $\text{H}_2/\text{Ni}$ .