

Half Yearly Examination 2014-15

Class - XI

Subject - Chemistry

M. M. : 35

Time : 2 hrs.

General Instructions :-

- (i) All questions are compulsory.
- (ii) Marks are indicated against each question.

- Q.1. Consider the following species : (1)
 N^{3-} , O^{2-} , F^- , Na^+ , Mg^{2+} and Al^{3+}
What is common in them ?
- Q.2. What is the basic difference between the term electron -gain enthalpy and electronegativity? (1)
- Q.3. Write Ideal Gas Equation. (1)
- Q.4. State Dalton's law of partial pressure. (1)
- Q.5. For the process to occur under adiabatic conditions, the correct conditions is : (1)
(i) $\Delta T = 0$
(ii) $\Delta P = 0$
(iii) $q = 0$
(iv) $w = 0$
- Q.6. Explain why cations are smaller and anions are larger in radii than their parent atoms ? (2)
- Q.7. State the following :- (2 × 1 = 2)
(i) Boyle's law
(ii) Charle's law
- Q.8. What will be the minimum pressure required to compress 500 dm³ of air at 1 bar to 200 dm³ at 30°C. (2)
- Q.9. A vessel of 120 mL capacity contains a certain amount of gas at 35°C and 1.2 bar pressure. The gas is transferred to another vessel of volume 180 mL at 35°C. What would be its pressure? (2)
- Q.10. What is Hess's law of Constant Heat Summation ? (2)

- Q.11.** Predict the formula of the stable binary compounds that would be formed by the following pairs of elements : (1 × 3 = 3)
- (i) Lithium and Oxygen
 - (ii) Magnesium and Nitrogen
 - (iii) Silicon and oxygen
- Q.12. (a)** Distinguish between a sigma and a pi bond.
- (b)** What is the total number of sigma and pi bonds in the following molecules ?
- (i) C_2H_2 (ii) C_2H_4 (1 + 2 = 3)
- Q.13.** Compare the relative stability of the following species and indicate their magnetic properties: O_2 , O_2^+ and O_2^- (superoxide) (1 × 3 = 3)
- Q.14.** Write the resonance structures for SO_2 , NO_2 and NO_3^- . (1 × 3 = 3)
- Q.15.** The enthalpy of combustion of methane, graphite and dihydrogen at 298 K are $-890.3 \text{ KJ mol}^{-1}$, $-393.5 \text{ KJ mol}^{-1}$ and $-285.8 \text{ KJ mol}^{-1}$ respectively. What will be Enthalpy of formation of CH_4 . (3)
- Q.16. (a)** What do you mean by Standard enthalpy of formation ?
- (b)** Calculate the standard enthalpy of formation of $CH_3OH(l)$ from the following data :
- $CH_3OH(l) + \frac{3}{2} O_2(g) \rightarrow CO_2(g) + 2H_2O(l) \Delta_f H^\circ = -726 \text{ KJ mol}^{-1}$
- $C(\text{graphite}) + O_2(g) \rightarrow CO_2(g); \Delta_c H^\circ = -393 \text{ KJ mol}^{-1}$
- $H_2(g) + \frac{1}{2} O_2(g) \rightarrow H_2O(l); \Delta_f H^\circ = -286 \text{ KJ mol}^{-1}$ (2 + 3 = 5)