

Abejay, SS

SS

First Terminal Examination 2014-2015

Chemistry

Class-XI

Time : 3 Hours

Maximum Marks : 70

Instructions :

- (i) All questions are compulsory.
- (ii) Questions 1-5 carry 1 mark each.
- (iii) Questions 6-10 carry 2 marks each.
- (iv) Questions 11-22 carry 3 marks each.
- (v) Questions 23 carries 4 marks.
- (vi) Questions 24-26 carry 5 marks each.

1. Out of molarity and molality which changes with temperature and why?
2. Name the orbitals with the following quantum numbers : s p d f
0 1 2 3
 - (i) $n = 2, l = 1$, 2 p
 - (ii) $n = 4, l = 0$ 4 s
3. Write the electronic configuration of Cu^+ ion (Atomic number of Cu = 29)
4. The 4f subshell of an atom contains 9 electrons. What is the maximum number of electrons having spin in the same direction?
5. Why Bohr's orbits are also called stationary states?
6. Arrange O^{2-} , F^- and Ne in increasing order of radius. Justify your answer.
7. Explain why chlorine can be converted into chloride ion more easily as compared to fluoride ion from fluorine.
8. Explain why IE_1 of Mg is more than Na while IE_2 of Na is more than Mg?
9. (a) X belongs to group II and Y belongs to group XV of periodic table. What is the formula of the compound formed by them?
10. (a) IE_1 of Ga is more than expected why?
(a) What is the basic difference between electron gain enthalpy and electronegativity?

- (b) Do you agree with the statement that electronegativity of nitrogen is 3.0 in all the nitrogen compounds. Justify your answer.
11. (a) Would you expect the second electron gain enthalpy of O as positive, more negative or less negative than the first. Justify your answer.
(b) Why IE_1 of Be is higher than that of B?
12. (a) If the density of methanol is 0.793 kg l^{-1} ? What is its volume needed for making 2.5 litres of its 0.25 M solution.
(b) How many moles of carbon atoms are present in 2 moles of C_2H_6 .
13. Calculate the mass of $Ca_3(PO_4)_2$ formed when 1.11 g of $CaCl_2$ is reacted with 20 ml of 2 M H_3PO_4 solution. What is the limiting reagent? How much of the limiting reagent is left?



(Ca = 40, Cl = 35.5, P = 31, O = 16)

14. (a) Calculate the molarity of a 2 molal aqueous H_2SO_4 solution. Density 1.5 g ml^{-1} .
(b) What is the normality of this solution?
15. What is the mole fraction of water and NaCl in 2.0 molar aqueous solution of NaCl. Density is 1.2 g ml^{-1} (Na = 23, H = 1, O = 16)
16. 20.0 g of impure $CaCO_3$ reacted completely with excess of HCl to produce 5.0 g CO_2 . What is the % purity of $CaCO_3$.
17. (a) Why half filled and completely filled orbitals are associated with extra stability.
(b) Define and explain Aufbau principle with examples.
18. (a) Why is the electronic configuration of oxygen $1s^2 2s^2 2p_x^2 2p_y^1 2p_z^1$ and not $1s^2 2s^2 2p_x^2 2p_y^2$. Name and state the rule.
(b) How many nodes are present in 3p orbitals?
19. (a) Draw and explain the shape of ethene molecule (orbital overlap diagram).
(b) What is the hybridisation of carbon in ethane and ethyne molecule.
20. Find bond order of molecular species O_2 , O_2^- and O_2^+ . Arrange them in the order of their stability.
21. (a) Why NF_3 is pyramidal while BF_3 is triangular planar.
(b) Why H_2O is a liquid while H_2S is a gas?

H_2O

NO
hydrogen bond
2

