SESSION ENDING EXAMINATION 2012-2013

CHEMISTRY
CLASS XI

TIME: 3.00 HrsMax.Marks:70

General Instructions:

i. All questions are compulsory.
ii. Q.Nos. 1 to 8 are very short answer and carry 1 mark each.
iii. Q Nos. 9 to 18 are short answer questions and carry 2 marks each.
iv. Q Nos. 19 to 27 are short answer questions and carry 3 marks each.
v. Q Nos. 28 to 30 are long answer questions and carry 5 marks each.
vi. Use log table if necessary.

1. Define Orbitals?
2. Write Vander Waal's equation for 1 mole of the gas?
3. Calcium (Z=20) loses electron successively to form ca^{+1}, ca^{+2} and ca^{+3}. Which step will have highest ionization enthalpy?
4. What are the conditionsfor adiabatic process?
5. Calculate the number of neutrons in Deuterium?
6. Write conjugate acid and conjugate base of water?
7. What is SI unit of mass?
8. Write IUPAC name of $CH_3CH(OH)CH_2COOH$
9. If the speed of light is 3.0×10^8 m/s. calculate the distance covered by light in 2 nano second.
10. Calculate the number of atoms in each of the following-
    a. 52 moles of He.
    b. 52 gram of He.
11. Give the hybridization state of -
    a. NO_3^- ion or SO_2
    b. CH_4or NH_3

12. Sample of HI (g) is placed in the flask at a pressure of 0.2 atm. At equilibrium, the partial pressure of HI (g) is 0.04 atm. What is the value of K_p for the given equilibrium?

13. Complete the following chemical reactions-

a. $PbS+H_2O_2 \rightarrow$

b. $Ca_3N_2+H_2O \rightarrow$

14. Give a brief account of the following-

a. Blue colored solution of Alkali metals in liquid Ammonia.

b. Tendency to give flame colors by alkali metals.

15. Is Boric Acid a Protic Acid? Explain.

16. Calculate the SIGMA and PIE bonds in the following molecules-

a. $CH_2=C=CH_2$

b. C_2H_2

17. An organic compound contains 69% Carbon and 4.8% Hydrogen, the remainder being Oxygen. Calculate the masses of CO_2 and H_2O produced when 0.20 gram of this substance is subjected to complete combustion.

18. Draw cis and trans structure of Hex-2-ene. Which isomer will have higher b.p.

19. a. Write Mendeleev's periodic law.

b. Consider the following species. N^{3-}, O^{2-}, F^-, Na^+, Mg^{2+}, and Al^{3+}

i. What is common in them?

ii. Arrange them in order of increasing ionic radii?

20.

a. Why free rotation about a π- bond is not possible?

b. Why H_2O is liquid while H_2S is a gas?

c. Why water has maximum density at 277K

21. Calculate the volume Occupied by 8.8gm of CO_2 at 31.1°C and 1 bar pressure.(R=0.083bar $LK^{-1}mol^{-1}$

OR

What would be SI unit of quantity PV^2T^2/n.

22. The degree of ionization of a 0.1 M bromoacetic acid solution is 0.132. Calculate the P^H of solution and the P^{Ka}ofbromoacetic acid.

23. Write the balanced ionic equation for the reaction-

$Cr_2O_7^{2-}(aq)+SO_3^{2-}$--------→ $Cr^{3+}(aq)+SO_4^{2-}(aq)$

24. What is the cause of anomalous behavior of first member of each s and p block elements?

25. How inorganic benzene is formed and draws its structure? Also write the hybridization of B and N in it?

26. Explain why $(CH_3)_3C^+$ is more stable than $CH_3CH_2^+$ and CH_3^+ is the least stable carbocation.

27. What are the major causes of water pollution? Write at least two steps to minimize water pollution.

28. a. Write short notes-
   i. Pauli's Exclusion principle
   ii. Aufbau principle
   iii. Hund's rule of maximum multiplicity

   b. An element with mass number 81 contains 31.7% more neutrons as compared to protons. Assign the atomic symbol.

Or

   a. Write a neutral molecule which is isoelectronic with ClO^-
   b. Which is more paramagnetic Fe^{3+} OR Fe^{2+}?
   c. What transition in the hydrogen spectrum would have the same wave length as the Balmer transition $n_1=4$ ton$_2=2$ of He+ spectrum?

29. a. Define enthalpy change.

   b. Calculate the standard enthalpy of formation of CH_3OH (l) from the following data-
   i. $CH_3OH\ (l) + 3/2\ O_2\ (g) \text{ --------> } CO_2\ (g) + 2H_2O\ (l)$; $\Delta_r H^0 = -726 KJMol^{-1}$
   ii. $C\ (s) + O_2\ (g) \text{ ----------> } CO_2\ (g)$; $\Delta_c H^0 = -393 KJMol^{-1}$
   iii. $H_2\ (g) + ½\ O_2\ (g) \text{ ----------> } H_2O\ (l)$; $\Delta_f H^0 = -286 KJMol^{-1}$

OR

   a. For an isolated system, $\Delta U=0$, what will be ΔS?
   b. The enthalpy of combustion of Methane, Graphite and Dihydrogen at 298K are $-890.3 KJMol^{-1}$, $-393.5 KJMol^{-1}$ and $-285.8 KJMol^{-1}$ respectively. Calculate enthalpy of formation of $CH_4(g)$.

30. a. An Alkene A on ozonolysis gives a mixture of Ethanal and pentan-3-one. Write structure and IUPAC name of A.

b. How would you convert the following compounds in to benzene-

i. Ethyne to Benzene

ii. Benzene to Nitrobenzene

OR

Addition of HBr to propene yields 2-bromopropane, while in the presence of benzoyl peroxide the same reaction yields 1-bromopropane.Explain and give mechanism.

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