Guess Paper – 2014
Class – XI
Subject – CHEMISTRY

Time:3.00 Hr.   **MM**:70

### [SET-A]

General Instructions :

1.   All questions are compulsory.

2.   Questions no. 1 to 8 are very short answer questions and carry 1 mark each.

3.   Questions no. 9 to 18 are short answer questions and carry 2 marks each.

4.   Questions no. 19 to 27 are also short answer questions and carry 3 marks each.

5.   Questions no. 28 to 30 are long answer questions and carry 5 marks each.

6.   Use log tables if necessary, use of calculators is not allowed.

1.   How do you think, gram atomic mass and mass of one atom of an element are related?.   1

2.   Write IUPAC name for: 1

(i)   (ii)   **COOH**
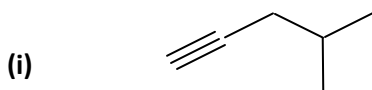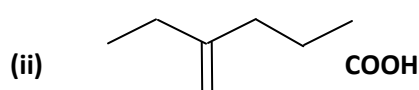
        OH   **O**

3.   What is wrong with the following notation?   1

        $n = 0$, $l = 0$, $m = 0$, $s = +\frac{1}{2}$

4.   State one application of aqueous tension.   1

5.   State what is +E effect ?   1

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6. What do the notation $\Delta H_f^{\,o}$ stand for? . 1

7. Will an aqueous solution of CH_3COONa be acidic or alkaline? Justify. 1

8. Of skew, staggered and eclipsed conformations of ethane, which one would have minimum energy? Why? 1

9. Distinguish between accuracy and precision. 2

10. Write down the equations only corresponding to the following reactions: 2

(a) Fittig reaction (b) Controlled oxidation of methane to methanol

11. State why : 2

(a) The numbers 2, 8, 18 and 32 are called magic numbers.

(b) Helium although a noble gas is a s-block element.

12. The first (IE_1) and second (IE_2) ionization energies (KJ mol^{-1}) of three different elements designated by Roman numerals are given as under: 2

Element	I	II	III
IE_1	403	549	1142
IE_2	2640	1060	2080

Which of these elements is likely to be :

(i) a non metal

(ii) an alkali metal

(iii) an alkaline earth metal

(iv) a metal which forms binary halide of the formula AX_2 where X stands for halogen.

13. Distinguish between emission and absorption spectra. 2

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OR

(a) Write down the Rydberg formula for Pfund series.

(b) What is the significance of the '−' sign in the expression: $E_n = (-1312 \times Z^2)/n^2$ KJmol^{-1}?

14.   How do you think the following are related?   Justify your answers.   2

(a) ethanol and dimethyl ether   (b) propan-2-one and prop-1-en-2-ol

15.   Explain the buffer action of a basic buffer.   2

16.   With the help of a suitable reaction , state what is meant by 'Aromatization' of alkanes.   2

17.   Account for the following :   2

(a) Alkali metals and their salts burn with specific coloured flames..

(b) Mobilities of alkali metal ions follow the sequence $Li^+ < Na^+ < K^+ < Rb^+ < Cs^+$ in aqueous

solution.

18.   Explain why :   2

(i) Atomic radius of Ga is less than that of Al.

(ii) Only thallium forms a mono chloride.

19.   What is meant by β-elimination reaction? With the help of a suitable chemical equation, show how   this reaction can be used for preparing an alkene.   3

20.   (a) Explain the order of stability of carbocations as $(CH_3)_3C^+ > (CH_3)_2C^+H > CH_3C^+H_2 > H_3C^+$.

(b) Why do you think, hyperconjugation can be called no-bond resonance?   3

21.   Discuss why the gases like CO_2 and $CH_4$are called green house gases. What according to you will be the most dreadful consequence of global warming?   3

22.   **(a)** What is Hund's rule ?   3
    (b) A golf ball has a mass of 40 g and a speed of 45ms^{-1}.If the speed can be measured within an accuracy of 2 %, Calculate the uncertainty in the position.

23.   **(i)** State what is coefficient of viscosity ?   3

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(ii) Calculate the volume occupied by 8.8 g of CO_2 at 31.1^0C and 1 bar pressure.
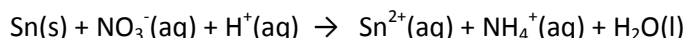
[R = 0.083 bar L $K^{-1}mol^{-1}$]

24. **(i)** Derive the relationship : $K_p \neq K_c (RT)^{\Delta n}$. Symbols having usual sense.   3

(ii) Name the conjugate bases of the following species :

(a) HCO_3^{2-} **(b)** CH_3COOH
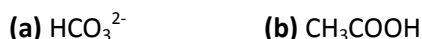
25. (a) In terms of oxidation number, What is reduction ?   3

(b) Balance the following equation in acidic medium by half equation method :

$Sn(s) + NO_3^-(aq) + H^+(aq) \rightarrow Sn^{2+}(aq) + NH_4^+(aq) + H_2O(l)$

26. State what are :   3

(a) Non-stoichiometric hydrides.   **(b)** Anion exchangers.   **(c)** 30 volume H_2O_2.

27. **(a)** What is slaking of lime? Write the corresponding equation.   3

(b) Alkali and alkaline earth metals cannot be obtained by chemical reduction method. Comment.

(c) Why Potassium carbonate cannot be prepared by Solvay process?

OR

(a) Li shows similarities to which element of periodic table ? What this phenomenon is called ?

(b) What is dead burnt plaster? How is it obtained from gypsum?

(c) Halides of Li are most covalent whereas halides of Cs are most ionic. Explain

28.   **(a)** Account for the following :   5

(i) Although geometries of NH_3 and H_2O are distorted tetrahedral, bond angle in NH_3 is larger   than that in H_2O .

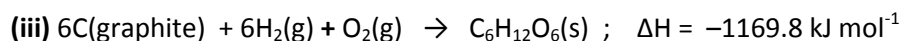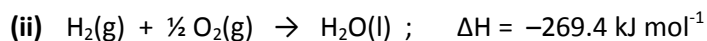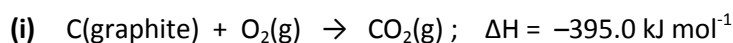**(ii)** pi-bond is always formed in association with sigma-bond.

(b) Use MOT to compare the stabilities and magnetic behavior of H_2^+ and H_2^-.

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OR

(a) Write two differences between bonding and non bonding molecular orbitals. **(b)** Compare the stability and magnetic behaviour of N_2^+ and N_2.

29. **(a)** Derive $\Delta H = \Delta U + \Delta_{ng}RT$, symbols having usual sense. 5

(b) Calculate the enthalpy change accompanying the combustion of glucose from the following data :

(i) $C(graphite) + O_2(g) \rightarrow CO_2(g)$; $\Delta H = -395.0 \text{ kJ mol}^{-1}$

(ii) $H_2(g) + \frac{1}{2} O_2(g) \rightarrow H_2O(l)$; $\Delta H = -269.4 \text{ kJ mol}^{-1}$

(iii) $6C(graphite) + 6H_2(g) + O_2(g) \rightarrow C_6H_{12}O_6(s)$; $\Delta H = -1169.8 \text{ kJ mol}^{-1}$

OR **(a)** Explain why heat of neutralization of a strong acid and strong base is always constant irrespective of their nature?

(b) Calculate the heat of reaction of the following reaction:

$CO_2(g) + H_2(g) \rightarrow CO(g) + H_2O(g)$
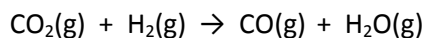
Given that; $\Delta H_f^{\circ} CO(g) = -110.5 \text{ KJ}$, $\Delta H_f^{\circ} CO_2(g) = -393.8$, $\Delta H_f^{\circ} H_2O(g) = -241.8 \text{ KJ}$ respectively.

30. **(a)** With the help of relevant chemical equations, state what is borax bead test ? What type of cations are tested by this test ?

(b) Explain why $SiCl_4$ can be hydrolyzed whereas CCl_4 cannot. 5

OR **(a)** Discuss the structure of diborane.

(b) Account for the following :

(i) $PbCl_4$ is less stable than $SnCl_4$ but $PbCl_2$ is more stable than $SnCl_2$.

(ii) Elemental silicon does not form graphite like structure.

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