UTTWAR.

RAMJAS, R.K.P.

3/10

SUMMATIVE ASSESSMENT I: 2015-2016
CLASS – XI
CHEMISTRY (THEORY)

Time: 3 Hours **Max. Marks: 70**

General Instructions:

1. All questions are compulsory.
2. Question numbers 1 to 5 are very short answer questions and carry 1 mark each.
3. Question numbers 6 to 10 are short answer questions and carry 2 marks each.
4. Question numbers 11 to 22 are also short answer questions and carry 3 marks each.
5. Question number 23 carries 4 marks.
6. Question numbers 24 to 26 are long answer questions and carry 5 marks each.
7. As far as possible, attempt in serial order.

1+2+24.

1. State the Law of Multiple proportions.
2. What two informations are conveyed by azimuthal quantum number?
3. In terms of Charle's Law, explain why -273.15° C is the lowest temperature?
4. The electron gain enthalpy of O is highly negative while that of N is slightly positive. Comment.
5. Chlorine has two isotopes of atomic mass units 34.97 and 36.97. The relative abundances of these two isotopes are 0.755 and 0.245 respectively. Find the average atomic mass of chlorine.
6. Draw the Lewis dot structures of:
   (i) NO_2^-
   (ii) HNO_3
7. Briefly explain any four factors governing the ionisation enthalpy.
8. An inorganic salt gave the following percentage composition:
   Na=29.11, S=40.51, and O=30.38. Calculate the empirical formula of the salt.
9. Give the electronic configuration of Cr and Cu. Comment on their anomalous behavior.
10. Commercially available conc. HCl contains 38% of it by mass.
    (a) What is the molarity of this solution? The density of solution is 1.19 g/ml.
    (b) What volume of above conc. HCl is required to make 1 litre of 0.1M HCl?
11. What is meant by Photoelectric effect? Give its three salient features. Give Photoelectric equation.
12. On the basis of VSEPR theory, explain the shapes of:-
    (i) SO_2
    (ii) BrF_5
    (iii) ClF_3
13. Five L of CO_2 at 2 bar and 0.5L of N_2 gas at 3 bar are introduced in a two litres flask at 27°C. Calculate the resulting pressure.

Sec, Sod2, Sod3 ₹100/-

Serial - Admission code passport black and white
2. date of click.

14. Using hybridization concept, explain the formation of ethene molecule.
15. Using MOT, explain the energy level diagram of nitrogen molecule. Find its bond order also.
16. When electromagnetic radiation of wavelength 300nm falls on the surface of sodium, electrons are emitted with a kinetic energy of 1.68×10^5 J/mol. What is the minimum energy needed to remove an electron from sodium? What is the maximum wavelength that will cause a photoelectron to be emitted?
17. (a) Density of a gas is found to be 5.46 g/L at 27°C and 2 bar pressure. Calculate its density at STP.
    (b) An endothermic reaction is spontaneous, comment on its entropy change.
18. Which of the following pairs of elements would have more negative electron gain enthalpy? Explain:
    (i) N or O
    (ii) S or O
    (iii) C or Si
19. (a) What is the lowest value of n that allows g orbitals to exist?
    (b) Calculate the number of molecules in 1 litre of water assuming density of water is 1g/cm^3.
    (c) Define Hess's Law of constant heat summation.
20. A golf ball has a mass of 40g and a speed of 45m/sec. If the speed can be measured within an accuracy of 2%, calculate the uncertainty in it's position.
21. The wavelength of the first line in the Balmer series is 656nm. Calculate the wavelength of the second line and the limiting line in the Balmer series.
22. Calculate the enthalpy of formation of methane, given that the enthalpies of combustion of methane, graphite and hydrogen are -890.2kJ mol^{-1}, -393.4kJ mol^{-1} and -285.7kJ mol^{-1} respectively.
23. Water gets polluted due to human activities and natural processes. Human activities like disposal of domestic waste in rivers, use of pesticides, fertilizers etc. should be banned. Answer the following questions:
    (a) What should we do to reduce water pollution?
    (b) Give some harmful effects of polluted water.
    (c) What are the values associated with the question? (1+1+2)
24. (a) On the basis of Valence Bond theory of Covalent Bond, explain the formation of H_2 molecule. Also give the potential energy diagram.
    (b) Use the data and answer:

Element	IE_1	IE_2
I	2372	5251
II	520	7300
III	900	1760
IV	1680	3380

Which of the above element is likely to be?
(i) A reactive metal.
(ii) A reactive non-metal.
(iii) A noble gas.
(iv) A metal that forms a stable halide AX_2 (where X = halogen)

25. (a) Give the basic difference between electron affinity and electronegativity.
(b) Calculate the energy associated with the first orbit of He^+. What is the radius of this orbit?
(c) Two particles A and B are in motion. If the wavelength associated with particle A is $5x10^{-8}$m, Calculate the wavelength associated with particle B if its momentum is half of A.

26. (a) Define vander waals radius.
(b) What is meant by Quantisation of Angular Momentum?
(c) A welding fuel contains carbon & hydrogen only. Burning a small sample of it in oxygen gives 3.38g of CO_2, 0.690g of H_2O, and no other products. A volume of 10 litres (measured at STP) of this welding gas is found to weigh 11.6g. Calculate:
(i) Empirical formula of the gas.
(ii) Its molar mass.
(iii) Molecular formula.