Max. Marks=40   **Time-90 Minutes**

Instructions:

(i) All questions are compulsory.

Q.1. Yellow light emitted from a sodium lamp has wave length λ=5800 nm . What will be its wave number (ν) of the yellow light ?

(a) $1.72 \times 10^6 \ m^{-1}$ (b) 1.00×10^2

(c) $4.00 \times 10^6 \ m^{-1}$ (d) None of above

Q. 2. Which is a correct electronic configuration of f-block elements ?

(a) $ns^2 np^6 (n-1)d^{1-10}$ (b) $ns^2 ns^{(1-6)}$

(c) $ns^2 np^{(1-6)}$ (d) $ns^2 nd^{(1-10)}$

Q. 3. What is not unit of pressure ?

(a) bar   (b) N/m2

(c) Kg/m2   (d) Torr

Q. 4. Calculate the number of moles present in 6 gram of carbon ?

a) 0.5 moles   (b) 1.5 moles

(c) 5.0 moles   d) 12 moles

Q. 5. Molarity of NaOH in the solution prepared by dissolving in 4 gm in enough water to form 250 ml of solute ?

(a) 0.25m   (b) 0.22m

(c) 0.4m   (d) 0.34m

Q. 6. How many moles of electrons weigh on kilogram ?

(a) 6.022×10^{23} (b) $1/9.108 \times 10^{31}$

(c) $6022/9.108 \times 10^{54}$ (d) $1/9.108 \times 6.022 \times 10^8$

Q. 7. The set representing the correct order of first ionization potential is ?

(a) K > Na > Li   (b) Be > Mg > Ca

(c) B > C > N   (d) Ge > Si > C

Q. 8. Which of the following has least election affinity ?

(a) Oxygen   (b) Argon

(c) Nitrogen   (d) Boron

Q. 9. Sulphuric acid provides a simple example of

(a) Coordinate bonds   (b) non-covalent compound

(c) non-covalent ion   (d) none of these

Q 10. The shape and hybridization in BF_3 is ?

a) sp2, linear   b) sp3d, plannar

c) sp2, planar   d) sp3, planar

Q.11   10 g hydrogen is react with 64 g of oxygen. The amount of water formed (in moles) ?

(a) 3   (b) 4

(c) 1   (d) 2

Q. 12   The correct order of ionization enthalpy

a) B<Be<c<o<N   b)   B<Be<c< N< o

C) Be <B<C<N<o   d) Be<B<C<o<N

Q.13 The high metallic element will have the configuration

A)   2,8,7   B)2,8,8,5   C)2,8,8,1   D)2,8,2

Q.14

CASE STUDY   **(1+1+1)**

The energy of an electron in the orbit   does not change with time .However the electron will move   from a lower stationery state to a higher stationery state   when   required amount of energy is emitted when electron moves from higher   stationery state to lower stationery state . the energy change dose not take place in a continuous manner.

The frequency of radiations absorbed or emitted when transition occurs between two stationary   state that differ in energy by delta E

The angular momentum of an electron is quantized

Q (i). Which of the following equation is plank's equation

(a) $E=mc^2$ b) E==hu

(c) $E= hc^2$ (d) E=h ν

Q (ii). What is nature of light

a) Wave   b) particle

c) wave and particle   d) all of these

Q(iii). De Broglie equation is

a) $\lambda = h/mv$ b) $\lambda = h/mv_2$

c)) $\lambda = h/mv^2$ d) none of these

Q. 15   (1+1)

Assertion and Reason Questions

Directions : Each of these questions contain two statements, Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

(a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.

(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion

(c) Assertion is correct, reason is incorrect

(d) Assertion is incorrect, reason is correct.

Q.(i) Assertion : All isotopes of a given element show the same type of chemical behaviour.

Reason : The chemical properties of an atom are controlled by the number of electrons in the atom..

Q.(ii) Assertion : The position of an electron can be determined exactly with the help of an electron microscope.

Reason : The product of uncertainty in the measurement of its momentum and the uncertainty in the measurement of the position cannot be less than a finite limit.

Q.16 How many moles of methane are required to produce 22gm of Co2 after combustion.   (1 mark)

Q. 17. General electronic configuration of f -block elements (1 mark)

Q. 18 . Write two advantages of Bohr "s model of an atom. (1 marks)

Q. 19 Write difference between electronegativity and electron gain enthalpy.   1mark

Q. 20 Write two important characteristics of d block elements.   1 mark

Q. 21 Compare the dipole moment of NH_3 and NF_3.   1 mark

Q. 22 Write resonance structures of SO_3 ,NO_3^- 1 mark

Q.23 What is the sigma and pi bonds in the following molecules C_2H_4 , C_2H_2 1 mark

Q. 24. If n=2 ,Find the values of m and s .   (1 marks)

Q. 25. Write electronic configuration of cu+ and cr^{+++} .   (1 marks)

Q.26 Write electronic configuration of O_2 ,O_2^{--}, O_2^{++} . Compare stability on the basis of bond order.   2 mark

Q.27 Describe hybridization and shape of cH4 and pcl5   2 mark

Q.28 Which of the following pairs of elements would have more negative electron gain enthalpy

a) N or O   b) C or Si   2 marks

Q.29 Define the followings with examples   (2 marks)

(i) Aufbau principle

(iii) Hund's rule of maximum multiplicity

(iv) Palui exclusion principle

(v) Heisenberg's uncertainty principle

Q.30 A compound contains 4.07% hydrogen, 24.27% carbon and 71.65% chlorine. Its molar mass is 98.96g. What are its empirical and molecular formula?   (2 marks)

Q.31. Calculate the standard enthalpy of formation of CH_3OH. from the following data: (2marks)

(i) $CH_3OH(l) + 3/2\ O_2\ (g) ———> CO_2\ (g) + 2H_2O\ (l)$; $\Delta_r H^- = -726kj\ mol^{-1}$

(ii) $C(s) + O_2(g) ————>CO_2\ (g)$; $\Delta_c H^- = -393\ kj\ mol^{-1}$

(iii) $H_2(g) + 1/2O_2(g) —————>H_2O\ (l)$; $\Delta_f H^- = -286\ kj\ mol^{-1}$