



REVISION SHEET

SUBJECT:CHEMISTRY

CLASS-XI

TERM 1

Short answer type questions (1Mark)

1. Empirical formula of glucose is

- (a) $C_1H_2O_1$
- (b) $C_2H_1O_2$
- (c) $C_2H_3O_2$
- (d) $C_1H_1O_2$

2. Molarity of 1L water is

- (a) 55.5
- (b) 46.6
- (c) 35.5
- (d) 27.75

3. 200 g ethanol and 200g water is mixed together to prepare antifreeze mixture .What will be molality of solution.

- (a) 2.173m
- (b) 21.73m
- (c) 2.48m
- (d) 4.28m

4. How many moles of oxygen present in 0.3moles of CO_2 ?

- (a) 0.6
- (b) 0.1
- (c) 0.4
- (d) 0.3

5. How many moles of Na^+ ions present in 0.2M solution of Na_2SO_3 ?

- (a) 0.2
- (b) 0.6
- (c) 0.4
- (d) 0.02

6. Number of nodes in P_x subshell are.

- (a) 1
- (b) 2
- (c) $\frac{1}{2}$
- (d) 4

7. Which quantum number shows orientation of orbitals?

- (a) Principal quantum number
- (b) Azimuthal quantum number
- (c) Magnetic quantum number
- (d) Spin quantum number

8. Which value cannot be measured?

- (a) Wave length 20Pm
- (b) Value $< h/4\pi$
- (c) Value $> h/4\pi$
- (d) frequency > 40 Hz

9. Number of unpaired electrons present in Fe

- (a) 4
- (b) 5
- (c) 3
- (d) 6

10. Electrons cannot located in

- (a) Orbit
- (b) Orbital
- (c) Nucleus
- (d) Sub shell

11. Number of orbitals in a sub shell are:

- (a) $(2l+1)$
- (b) $2(2l+1)$
- (c) $(3l+1)$
- (d) n^2

12. Which type of system is human body?

- (a) Isolated system
- (b) Open system
- (c) Closed system
- (d) Reverse system

13. The maximum number of electrons in a subshell having the same value of spin quantum number is given by:

- (a) $l+2$ (b) $2l + 1$
 (c) $l(l+1)$ (d) $2(2l+1)$
14. The electronic configuration of P in H_3PO_4 is:
 (a) $1s^2 2s^2 2p^6 3s^2 3p^3$ (b) $1s^2 2s^2 2p^6 3s^2$
 (c) $1s^2 2s^2 2p^6$ (d) $1s^2 2s^2 2p^6 3s^2 3p^6 4s^1$
15. How many electrons in a given atom have the following set of quantum numbers?
 $N=3, l=2, m=+2, s=-1/2$
 (a) 1 (b) 18
 (c) 14 (d) not possible
16. How many electrons in 4th energy have $+1/2$ spin quantum number:
 (a) 16 (b) 8
 (c) 14 (d) 20
17. Number of moles of H^+ ions present in 0.2M, 200ml H_2SO_4 solution.
 (a) 0.08 (b) 0.04
 (c) 0.16 (d) 0.8
18. Number of moles in 8mg methane gas:
 (a) 5×10^{-4} (b) 2×10^{-4}
 (c) 2×10^{-3} (d) 4×10^{-2}
19. The electronegativity's of N, C, Si and P are in the order.
 (a) $\text{P} < \text{Si} < \text{C} < \text{N}$ (b) $\text{Si} < \text{P} < \text{N} < \text{C}$
 (c) $\text{Si} < \text{P} < \text{C} < \text{N}$ (d) $\text{P} < \text{Si} < \text{N} < \text{C}$
20. Which of the following elements has highest first ionization enthalpy?
 (a) Rb (b) Na
 (c) K (d) Sc
21. Which of the following has not electron in f subshell?
 (a) Uranium (b) Thorium
 (c) Radium (d) Lutetium
22. Which of the following has bond angle more 120° ?
 (a) BF_3 (b) BeCl_2
 (c) NH_3 (d) H_2O
23. 90° and 120° angles in PCl_5 respectively are:
 (a) 6 and 3 (b) 3 and 6
 (c) 6 and 8 (d) 8 and 6
24. ΔU is equal to:
 (a) Isobaric work (b) Adiabatic work
 (c) Isothermal work (d) Isochoric work
25. If the bond energies of H-H, Br-Br and H-Br are 433, 192 and 364 KJ/mol respectively, then $\Delta^0 H$ for the reaction:
 $\text{H}_2 + \text{Br}_2 \rightarrow 2\text{HBr}$ will be
 (a) -261KJ (b) +103kj
 (c) +261kj (d) -103kj

Short answer type questions(2 marks)

26. Define law of multiple proportions with example.
27. Calculate the molecular mass of $\text{C}_{12}\text{H}_{22}\text{O}_{11}$
28. Calculate the no. of atoms present in 11.5 litres of H_2 at N.T.P.
29. Calculate the no. of moles in 5.68 gm. of iron.
30. What is the effect of temperature on molality and molarity?
31. What is the frequency and wavelength of a photon emitted during a transition from

- $n=5$ state to $n=2$ state in the hydrogen atom.
32. Explain Heisenberg's uncertainty Principle.
 33. What do you understand by an atomic orbital? Briefly describe the shapes of s, p & 'd' orbitals?
 34. State and explain Aufbau's principle, Pauli's exclusion principle.
 35. Write down the quantum numbers 'n', 'l' and 'm' for the following orbitals
 36. Why d- and f-block elements are less electropositive than group 1 and 2 elements?
 37. What is diagonal relationship? Explain it with the help of 'Be' and 'Al'.
 38. What is ionisation enthalpy? On what factors it depends?
 39. What is electron gain enthalpy? On what factors it depends. How it varies in a group and in a period?
 40. How will you justify presence of 18 elements in 5th period and presence of 32 elements in 6th period?
 41. What is the significance of Lewis Symbols?
 42. Give structure of BrF_5
 43. Why H_2O is liquid and H_2S is a gas?
 44. Boiling point of p-nitrophenol is more than O-nitrophenol why?
 45. How is paramagnetic character of a compound is related to the no. of unpaired electrons?
 46. What is meant by extensive and intensive properties?
 47. What is meant by State function and path function?
 48. Express the change in internal energy of a system when 'W' amount of work is done by the system and 'q' amount of heat is supplied to the system. What type of system would it be?
 49. A system absorbs energy equivalent to 415 J and performs work equivalent to 5.15J. Calculate the change in internal energy of the system.

Long answer type questions(3Marks)

50. Give reason for the following:

- (a) Four bonds CH_4 cannot arrange in square planar.
- (b) Axial bonds of PCl_5 are longer than equatorial bonds.
- (c) Boiling point of O-nitro phenol is less than p-nitro phenol.

51. Find molality of 0.4M NaOH solution having density 1.04g/ml.
52. What is meant by transition elements? Write their three general characteristics.
53. State three characteristics each of s- and p- block elements.
54. Calculate the work done when a gas is irreversibly compressed by a pressure of 0.50 atm to decrease its volume from 400cm^3 to 200cm^3
55. Among the elements of the thirteen group, Pick out the elements:
 - (i) With highest first ionisation enthalpy
 - (ii) With largest atomic radius
 - (iii) Which is most reactive non-metal
 - (iv) Which is most reactive metal
56. Write short note on inner transition elements.
57. Arrange O_2 , O_2^+ , O_2^- , O_2^{2+} , O_2^{2-} according to bond order and stability of molecule.
58. 2.746g of a compound gave on analysis 1.94g of silver, 0.268g of sulphur and 0.538g of oxygen. Calculate the empirical formula of the compound [At. Mass: Ag = 108, S = 32, O = 16]

59..(i) Give the number of unpaired electrons in the species Cu^+ .

(ii) The threshold frequency for a metal is 7.0×10^{14} . Calculate the kinetic energy of an

Electron emitted when radiation of frequency is $1.0 \times 10^{15} \text{ s}^{-1}$ hits this metal.

Case-Based study type questions(4Marks)

60. Read the passage and give answer of following questions:

According to De Broglie every moving material particle has a dual nature i.e. wave and particle nature. The two character are co-related by de Broglie relation $\lambda = \frac{h}{mv}$ here λ represent wave nature while mv accounts for particle nature, since h is constant, the two characters are inversely proportional to each other. This relation is valid mainly for microscopic particles such as electron, proton, atoms, ions molecules etc. It does not apply to macro particles.

(a) If electron and alpha particle (He^{2+}) are moving with same speed then find which will travel with longest wave length? [mass of electron = $9.1 \times 10^{-31} \text{ kg}$]

Or

If an electron is moving in one second equal to its wavelength then find its velocity in terms of h and m (mass of particle)

(b) Find De Broglie wave length of a body whose mass is 10 mg is moving with velocity 100 ms^{-1} .

(c) An electron is moving with kinetic energy $9.1 \times 10^{-31} \text{ kJ}$, Find its De Broglie wave length[$h = 6.626 \times 10^{-34} \text{ Js}$]

61. Read the passage and give answer of following questions:

Most of reactions are carried at constant pressure. Change in enthalpy (ΔH) and change in internal energy (ΔU) related as:

$\Delta H = \Delta U + \Delta n_g RT$, The enthalpy of free elements is zero.

According to Hess's law, the change in enthalpy in a chemical reaction does not depend upon the path followed by the reactants while changing into the products. It is the difference in the enthalpies of the products and of reactants.

(a) The enthalpy of formation of ammonia is -46.0 kJ/mol . Then find enthalpy change for reaction: $\text{N}_2 + 3\text{H}_2 \rightarrow 2\text{NH}_3$

Or

The enthalpy of reaction $\text{C} + \text{O}_2 \rightarrow \text{CO}_2$ is -404.2 kJ/mol , Find energy released in combustion 20 g of carbon.

(b) Define internal energy.

(c) How much heat will evolve on mixing 200 ml , 0.2 M HCl with 300 ml 0.01 M NaOH solution.

61. Read the following passage and give answer of following questions

An orbital of smaller size means there is more chance of finding the electron near the nucleus. Similarly shape and orientation mean that there is more probability of finding the electron along certain directions than along others. Atomic orbitals are precisely distinguished by quantum numbers. Each orbital is designed by three quantum numbers labeled as n, l and m .

(a) Which quantum number determines the radius of the orbit?

(b) Which quantum number determines the orientation of orbitals?

(c) Draw the shapes of d- orbitals

Or

(d) Find all quantum numbers for last electron of sodium.

Long answer type questions(5 Marks)

62. (a). Draw orbital energy diagram for N₂ formation by molecular orbital theory.

(b) Arrange N₂, N₂⁺, N₂⁻, N₂²⁺ and N₂²⁻ in decreasing order of bond order.

(c) Write three points of VSEPR theory and draw shapes of BrF₃ and SF₆ also name the shapes.

63. What is meant by extensive and intensive properties?

64. What is meant by State function and path function?

65. Express the change in internal energy of a system when 'W' amount of work is done by the system and 'q' amount of heat is supplied to the system. What type of system would it be?

66. A system absorbs energy equivalent to 415 J and performs work equivalent to 5.15J. Calculate the change in internal energy of the system.

67. 31. Work function for caesium atom is 1.9 eV. Calculate (a) Threshold wave length and (b) the threshold frequency of the radiation. If the caesium element is irradiated with a wavelength 500nm, calculate the kinetic energy and velocity of the ejected photoelectron.

68. Give reason for the following:

(a) Electron gain enthalpy of Oxygen is less than sulphur.

(b) Electron gain enthalpy increase L- R in period.

(c) Electron gain enthalpy of noble gases is positive.

69. (a) Enthalpy of ionization of nitrogen is greater than oxygen.

(b) Enthalpy of ionization of Mg is greater than aluminium.

70. Use the molecular orbital energy diagram to show that N₂ would be expected to have a triple bond, F₂, a single bond and Ne₂, no bond.

71. 31. Calculate the energy and frequency of the radiation emitted when an electron jumps from n = 3 to n = 2 in hydrogen atom.

72. (a) Find the position of elements in periodic table having atomic number 25, 19 and 35.

(b) Gallium is located below Aluminium in same group in periodic table but radius of Ga is less and enthalpy of ionisation more than Al. Explain.

73. (a) Draw energy orbital diagram for O₂ formation.

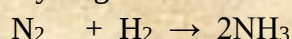
(b) From O₂ to O₂⁺ and O₂⁻ formation in which bond length will decrease?

74. 33.(a) Draw the structures of XeO₃, BrF₃ and XeOF₄ using VSEPR theory.

(b) Draw the structure of iso-structural compound of I₃¹⁻.

75. A welding fuel gas contains carbon and hydrogen only. Burning a small sample of it in oxygen gives 3.38g carbondioxide, 0.690g of water and no other products. A volume of 10L at STP of this welding gas is found to weigh 11.6g. Calculate (i) empirical formula (ii) molar mass of the gas (iii) molecular formula.

76.. Nitrogen and hydrogen react to form ammonia according to the reaction



If 1000g of H₂ reacts with 2000g of N₂,

(a) Which is limiting reagent?

(b) What is the quantity of NH₃ formed?

(c) Which reactant will left unreacted?

(d) What is the quantity of left reactant?

77. 14. Find mass of calcium carbonate which can be dissolved in 400ml, 0.05M HCl solution.

78. Time period for a E.M. wave is 5 neno second find frequency, wave length and wave number. [h = 6.022x 10⁻³⁴ JS]

79. A photon of frequency 4x 10¹⁴ Hz strike with metal surface whose thresh hold frequency is

$5 \times 10^{12} \text{ Hz}$ find kinetic energy of photoelectron emitted.

80. 22. Why cannot Heisenberg's uncertainty principle apply on moving cricket ball ?

81. Explain the following:

(a) Electronegativity of elements increase on moving from left to right in the periodic table.

(b) Ionisation enthalpy decreases in a group from top to bottom?

(c) Atomic radius of noble gases is greater than halogens.

82. Among the elements B, Al, C and Si.

(a) Which element has the highest first ionisation enthalpy?

(b) Which element has the most metallic character? Justify your answer in each case.

83. Find hybridisation, geometry and draw the shapes of (a) SF_6 (b) XeF_4 .

84. Explain the following terms:

(a) Electron gain enthalpy

(b) Diagonal relationship

85. Draw energy orbital diagram of N_2 also find bond order and magnetic property of it.

86. The enthalpy of combustion of methane, graphite and dihydrogen at 298 K are -890 kJ/mol , -393.5 kJ/mol and -285.8 kJ/mol respectively. Find enthalpy of formation of CH_4 .

87. Energy of an electron in the ground state of hydrogen atom is $-2.18 \times 10^{-18} \text{ J}$. Calculate

the ionization enthalpy of He^+ in terms of kJ/mol .

88. Write two exceptions of hybridisation theory with example.

89. Explain molecular orbital theory. Write difference in bonding and anti bonding orbitals.

90. Explain Hess's law with example.