

NEW SYLLABUS
2 MARKS COLLECTION FOR NEW
SYLLABUS

11th Standard - New

Chemistry

Reg.No. :

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Time : 01:40:00 Hrs

Total Marks : 200

112 x 2 = 224

- 1) Define orbital? what are the n and l values for $3p_x$ and $4d_{x^2-y^2}$ electron?
- 2) The stabilisation of a half filled d - orbital is more pronounced than that of the p-orbital why?
- 3) How many orbitals are possible for $n = 4$?
- 4) How many radial nodes for 2s, 4p, 5d and 4f orbitals exhibit? How many angular nodes
- 5) Which quantum number reveal information about the shape, energy, orientation and size of orbitals?
- 6) How fast must a 54g tennis ball travel in order to have a de Broglie wavelength that is equal to that of a photon of green light 5400\AA ?
- 7) For each of the following, give the sub level designation, the allowable m values and the number of orbitals
 - (i) $n = 4, l = 2$, (ii) $n = 5, l = 3$ (iii) $n = 7, l = 0$
- 8) Give the electronic configuration of Mn^{2+} and Cr^{3+}
- 9) Consider the following electronic arrangements for the d^5 configuration. (a)

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 (b)

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 (c)

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 - (i) which of these represents the ground state
 - (ii) which configuration has the maximum exchange energy.
- 10) Write a note on Thomson's plum pudding model of an atom.
- 11) What did Rutherford's alpha ray scattering experiment prove
- 12) What are the defects of Rutherford's model?
- 13) What is the charge and mass of an electron?
- 14) What is the difference between atomic mass and mass number?
- 15) Give the number of electrons in the following species. H_2 , H_2^+ , O_2 and O_2^-
- 16) How many neutrons and protons are there in the Following nuclei?

C, O, Mg, Fe, Sr
- 17) After the execution of the alpha-ray scattering experiment, what were the observations made by Rutherford? What did he conclude from his observations?

- 18) An atom of an element contains 35 electrons and 45 neutrons. Deduce
- the number of protons
 - the electronic configuration for the element
 - All the four quantum numbers for the last electron
- 19) Define modern periodic law.
- 20) What are isoelectronic ions? Give examples.
- 21) What is effective nuclear charge?
- 22) Is the definition given below for ionisation enthalpy correct?
- "Ionisation enthalpy is defined as the energy required to remove the most loosely bound electron from the valence shell of an atom.
- 23) Magnesium loses electrons successively to form Mg^+ , Mg^{2+} and Mg^{3+} ions. Which step will have the highest ionisation energy and why?
- 24) Define electro negativity.
- 25) How would you explain the fact that the second ionisation potential is always higher than first ionisation potential?
- 26) Give the general electronic configuration of lanthanides and actinides.
- 27) How does atomic and ionic radii vary across the group and period.
- 28) Explain why hydrogen is not placed with the halogen in the periodic table.
- 29) An ice cube at $0^\circ C$ is placed in some liquid water at $0^\circ C$, the ice cube sinks - Why? What will happen to ice at $0^\circ C$ placed in liquid water at $0^\circ C$?
- 30) An ice cube at $0^\circ C$ is placed in some liquid water at $0^\circ C$, the ice cube sinks - Why? An ice cube at $0^\circ C$ is placed in some liquid water at $0^\circ C$, the ice cube sinks. What is the nature of water? Justify,
- 31) Discuss the three types of Covalent hydrides.
- 32) Predict which of the following hydrides is a gas on a solid (a) BCl_3 (b) NaH . Give your reason.
- 33) Write chemical equation for the following reactions.
- hydrogen with tungsten (VI) oxide.
 - hydrogen gas and chlorine gas.
- 34) NH_3 has exceptionally high melting point and boiling point as compared to those of the hydrides of the remaining elements of group 15. Explain.
- 35) Why interstitial hydrides have a lower density than the parent metal.
- 36) Name the isotopes of hydrogen.
- 37) What is ortho hydrogen ?
- 38) What is para hydrogen?
- 39) Write short notes on Deuterium.
- 40) Which is the radio active isotope of Hydrogen? Write a note on it.
- 41) Give two uses of Tritium.
- 42) How is tritium prepared?
- 43) How is deuterium prepared from heavy water?
- 44) Explain the large scale production of Hydrogen.

- 45) Write a note on Haber's process. www.Padmasalai.Net www.TrbTnpsc.com
- 46) What is Hydrogenation?
- 47) What are the advantages of using hydrogen as fuel?
- 48) Complete the following reactions and balance them:
- (i) $\text{CO}_{(g)} + \text{H}_{2(g)} \rightarrow$
- (ii) $\text{CH}_{4(g)} + \text{H}_2\text{O}_{(g)} \rightarrow$
- 49) Give one example of a reaction in which dihydrogen acts as: (i) an oxidising agent
(ii) a reducing agent.
- 50) At room temperature, Hydrogen reacts very slowly. Explain
- 51) Explain the consequences of high enthalpy of H-H bond in terms of chemical reactivity of dihydrogen.
- 52) How will you classify water based on the spin of the nuclei of the hydrogen atoms?
- 53) Life underneath frozen lakes survive even bitter winter. Justify.
- 54) Why does water show high boiling point as compared to hydrogen sulphide? Give reasons for your answer.
- 55) Explain the reaction of water with metals of Group I.
- 56) What happens when steam is passed over hot iron.
- 57) Explain the reaction of water with halogens.
- 58) Water is an amphoteric oxide. Justify.
- 59) What causes hardness in water?
- 60) What is Heavy water?
- 61) What is Zeolite?
- 62) Ice floats on water. Give reason
- 63) Explain what is meant by e lerescence.
- 64) Write balanced chemical equation for each of the following chemical reactions.
- (i) Lithium metal with nitrogen gas
- (ii) heating solid sodium bicarbonate
- (iii) Rubidium with oxygen gas
- (iv) solid potassium hydroxide with CO_2
- (v) heating calcium carbonate
- (vi) heating calcium with oxygen
- 65) Give the systematic names for the following
- (i) milk of magnesia
- (ii) lye
- (iii) lime
- (iv) Caustic potash
- (v) washing soda
- (vi) soda ash
- (vii) trona
- 66) Substantiate lithium fluoride has the lowest solubility among group one metal fluorides.
- 67) Mention the uses of plaster of paris

- 68) Beryllium halides are covalent whereas magnesium halides are ionic why?
- 69) Write balanced chemical equation for the following processes
- heating calcium in oxygen
 - heating calcium carbonate
 - evaporating a solution of calcium hydrogen carbonate
 - heating calcium oxide with carbon
- 70) How is plaster of paris prepared?
- 71) Give the uses of gypsum
- 72) Suppose there is a tiny sticky area on the wall of a container of gas. Molecules hitting this area stick there permanently. Is the pressure greater or less than on the ordinary area of walls?
- 73) Which of the following gases would you expect to deviate from ideal behaviour under conditions of low temperature F_2 , Cl_2 , or Br_2 ? Explain.
- 74) Distinguish between diffusion and effusion.
- 75) Aerosol cans carry clear warning of heating of the can. Why?
- 76) Why do astronauts have to wear protective suits when they are on the surface of moon?
- 77) When ammonia combines with HCl, NH_4Cl is formed as white dense fumes. Why do more fumes appear near HCl?
- 78) Write a short note on the consequence of Boyle's law. (or) Give the relationship between pressure and density
- 79) When a real gas is converted from its initial to final state by adiabatic expansion, it is not possible to calculate its volume using Boyle's law. Why?
- 80) Define absolute zero. Is it possible to attain a further lower temperature? Comment on your answer.
- 81) Why are the airplane cabins artificially pressurized?
- 82) Why the size of a balloon in hot water is increased compared to a balloon in cold water.
- 83) State Charles law and give an example.
- 84) Define the terms isotherm, isobar and isochore.
- 85) Define pressure. Give its units.
- 86) Why should divers never hold their breath while diving?
- 87) Use of hot air balloon in meteorological observation is based on which gas law? Explain.
- 88) A gas is enclosed in a room. The pressure, density, temperature and number of moles are p atm, $g\text{ cm}^{-3}$, $t^\circ\text{C}$ and n moles respectively. What will be the pressure, temperature, density and number of moles, in each compartment. if room is partitioned into four equal compartments?
- 89) How does a person feel the effect of drop in pressure? Explain
- 90) State the following laws: (i) Avogadro's law
(ii) Gay-Lussac's law.
- 91) According to kinetic theory. What are the two assumptions made with regard to ideal gas?
- 92) State Dalton's law of partial pressure.
- 93) When a compressed real gas is made to expand adiabatically through a porous plug, how does the temperature change?

- 94) Comment on the statement: A sample of an ideal gas escapes into an evacuated container without any changes in its kinetic energy.
- 95) On what basis do you classify gases into permanent and temporary gases? Explain these types with example.
- 96) Derive the units of the vanderwaal's constants.
- 97) Imagine the molecular collisions to the gases were inelastic. What would have happened?
- 98) State the first law of thermodynamics.
- 99) Define Hess's law of constant heat summation.
- 100) Explain intensive properties with two examples
- 101) What is the usual definition of entropy? What is the unit of entropy?
- 102) Predict the feasibility of a reaction when
- (i) both ΔH and ΔS positive
 - (ii) both ΔH and ΔS negative
 - (iii) ΔH decreases but ΔS increases
- 103) Define Gibb's free energy.
- 104) Define enthalpy of combustion.
- 105) Define molar heat capacity. Give its unit
- 106) Define the calorific value of food. What is the unit of calorific value?
- 107) Define enthalpy of neutralization
- 108) What is lattice energy?
- 109) Give Kelvin statement of second law of thermodynamics.
- 110) State the third law of thermodynamics.
- 111) Identify the state and path function out of the following: a) Enthalpy b) Entropy c) Heat d) Temperature e) Work f) Free energy.
- 112) What are spontaneous reactions? What are the conditions for the spontaneity of a process



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