

SUDITI GLOBAL ACADEMY, MAINPURI

Sample Question Paper 2021-22

Term 1

CLASS XI

Subject: Chemistry

Time: 90 Minutes

Max. Marks: 35

General Instructions:

1. The Question Paper contains three sections.
2. Section A has 25 questions. Attempt any 20 questions.
3. Section B has 24 questions. Attempt any 20 questions.
4. Section C has 6 questions. Attempt any 5 questions.
5. All questions carry equal marks.
6. There is no negative marking.

SECTION A

This section consists of 25 multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

Q-1 The number of moles present in 6 gms of carbon is:

- (A) 2 (B) 0.5 (C) 5 (D) 1

Q-2 What is the concentration of nitrate ions if equal volumes of 0.1 M AgNO_3 and 0.1 M NaCl are mixed together

- (A) 0.1 N (B) 0.2 M (C) 0.05 M (D) 0.25 M

Q-3 The -ve charged particles is called:

- (A) Anion (B) Cation (C) Radical (D) Atom

Q-4 Which is not a unit of pressure:

- (A) Bar (B) N/m^2 (C) Kg/m^2 (D) Torr

Q-5 What is the normality of a 1 M solution of H_3PO_4

- (A) 0.5 N (B) 1.0 N (C) 2.0 N (D) 3.0 N

Q-6 The total number of ions present in 111 g of CaCl_2 is

- (A) One Mole (B) Two Mole
(C) Three Mole (D) Four Mole

Q-7 The increasing order (lowest first) for the values of e/m (charge/mass) for

- (A) e, p, n, α . (B) n, p, e, α
(C) n, p, α, e . (D) n, α, p, e

Q-8 The ionization enthalpy of hydrogen atom is $1.312 \times 10^6 \text{ J mol}^{-1}$. The energy required to excite the electron in the atom from $n = 1$ to $n = 2$ is

- (A) $8.51 \times 10^5 \text{ J mol}^{-1}$ (B) $6.56 \times 10^5 \text{ J mol}^{-1}$
(C) $7.56 \times 10^5 \text{ J mol}^{-1}$ (D) $9.84 \times 10^5 \text{ J mol}^{-1}$

Q-9 The element with atomic number 35 belongs to

- (A) d – Block (B) f – Block
(C) p – Block (D) s – Block

Q-10 The correct order of first ionization potential among following elements, Be, B, C, N and O is

- (A) $B < Be < C < O < N$ (B) $B < Be < C < N < O$

(C) $\text{Be} < \text{B} < \text{C} < \text{N} < \text{O}$ (D) $\text{Be} < \text{B} < \text{C} < \text{O} < \text{N}$

Q-11 Representative elements are those which belong to

(A) p and d – Block (B) s and d – Block

(C) s and p – Block (D) s and f – Block

Q-12 Which of the following properties generally decreases along a period?

(A) Ionization Energy (B) Metallic Character

(C) Electron Affinity (D) Valency

Q-13 On the Pauling's electronegativity scale the element next to F is

(A) N (B) Cl (C) O (D) Ne

Q-14 The bond length between hybridised carbon atom and other carbon atom is minimum in

(A) Propane (B) Butane (C) Propene (D) Propyne

Q-15 The number of nodal planes present in $s \times s$ antibonding orbitals is

(A) 1 (B) 2 (C) 0 (D) 3

Q-16 The hybrid state of sulphur in SO_2 molecule is :

(A) sp^2 (B) sp^3 (C) sp (D) sp^3d

Q-17 Which one of the following does not have sp^2 hybridised carbon?

(A) Acetone (B) Acetic acid

(C) Acetonitrile (D) Acetamide

Q-18 Which of the following will have the lowest boiling point?

(A) 2-Methylbutane (B) 2-Methylpropane

(C) 2,2-Dimethylpropane (D) n-Pentane

Q-19 The tendency of an electrode to lose electrons is known as

(A) Electrode Potential (B) Reduction Potential

(C) Oxidation Potential (D) E.M.F.

Q-20 If equal volumes of 1 M KMnO_4 and solutions are allowed to oxidize Fe^{2+} in acidic medium. The amount of iron oxidized will be:

(A) More with KMnO_2

(B) More with $\text{K}_2\text{Cr}_2\text{O}_7$

(C) Equal with both oxidising agents

(D) Cannot be determined

Q-21 Pure H_2O_2 is :

(A) Semi – solid (B) Liquid (C) Solid (D) Gas

Q-22 The freezing point of heavy water is

(A) 0°C . (B) 3.8°C (C) 4°C (D) 1°C

Q-23 H_2O_2 used in rocket has the concentration

(A) 50% (B) 90% (C) 70% (D) 30%

Q-24 The displacement of electrons in a multiple bond in the presence of attacking reagent is called

(A) Inductive effect (B) Electromeric effect

(c) Resonance (D) Hyper conjugation

Q-25 Which of the following cannot be represented by resonance structures?

(A) Dimethyl ether (B) Nitrate anion

(C) Carboxylate anion (D) Toluene

SECTION B

This section consists of 24 multiple choice questions with overall choice to attempt any 20 questions. In case more than desirable number of questions are attempted, ONLY first 20 will be considered for evaluation.

Q-26 Which one is the strongest acid among the following options?

- (A) CH_2FCOOH (B) CH_2ClCOOH
(C) CHCl_2COOH (D) CHF_2COOH

Q-27 Insulin contains 3.4% sulphur. The minimum molecular weight of insulin is

- (A) 350 (B) 470 (C) 560 (D) 940

Q-28 Which of the following hydrides are generally non stoichiometric in nature?

- (A) Ionic Hydrides (B) Molecular Hydrides
(C) Interstitial Hydrides (D) All of the Above

Q-29 What is the product of the reaction of H_2O_2 with Cl_2 ?

- (A) $\text{O}_2 + \text{HOCl}$ (B) $\text{HCl} + \text{O}_2$
(C) $\text{H}_2\text{O} + \text{HCl}$ (D) $\text{HCl} + \text{H}_2$

Q-30 Water shows anomalous behavior between

- (A) 0 to 4°C (B) 0 to 5°C
(C) 0 to -4°C (D) 4 to 0°C

Q-31 Which of the following statements regarding hydrogen peroxide is/ are incorrect?

- (A) As aerating agent in production of sponge rubber
(B) As an antichlor
(C) For restoring white colour of blackened lead painting
(D) All of the above

Q-32 Atomic hydrogen is called

- (A) Protium (B) Deuterium
(C) Nascent Hydrogen (D) Tritium

Q-33 The number of moles of KMnO_4 reduced by one mole of KI in alkaline medium is

- (A) One (B) Two (C) Five (D) One fifth

Q-34 Which of the following reactions does not involve either oxidation or reduction?

- (A) $\text{VO}_2^+ \rightarrow \text{V}_2\text{O}_3$

- (B) $\text{Na} \rightarrow \text{Na}^+$

- (C) $\text{CrO}_2^{2-} \rightarrow \text{Cr}_2\text{O}_7^{2-}$

- (D) $\text{Zn}^{2+} \rightarrow \text{Zn}$

Q-35 The value of n in the molecular formula $\text{BaAl}_2\text{Si}_6\text{O}_{18}$ is

- (A) 3 (B) 5 (C) 7 (D) 9

Q-36 Which of the following types of hybridisation leads to three dimensional geometry of bonds around the carbon atom?

- (A) sp (B) sp^2 (C) sp^3 (D) None of these

Q-37 An atom of an element A has three electrons in its outermost orbit and that of B has six electrons in its outermost orbit. The formula of the compound between these two will be

- (A) A_3B_6 (B) A_2B_3 (C) A_3B_2 (D) A_2B

Q-38 The chemistry of lithium is very similar to that of magnesium even though they are placed in different groups. Its reason is:

- (A) Both are found together in nature
- (B) Both have nearly the same size
- (C) Both have similar electronic configuration
- (D) The ratio of their charge and size (i.e. charge density) is nearly the same

Q-39 The element with atomic number 35 belongs to

- (A) d – Block (B) f – Block
- (C) p – Block (D) s – Block

Q-40 Representative elements are those which belong to

- (A) p and d – Block
- (B) s and d – Block
- (C) s and p – Block
- (D) s and f – Block

Q-41 Which of the following properties generally decreases along a period?

- (A) Ionization Energy
- (B) Metallic Character
- (C) Electron Affinity
- (D) Valency

Q-42 Which of the following weighs the most?

- (A) One g – atom of nitrogen
- (B) One mole of water
- (C) One mole of sodium
- (D) One molecule of H_2SO_4

Q-43 The group number, number of valence electrons, and valency of an element with the atomic number 15, respectively are

- (A) 16, 5 and 2 (B) 15, 5 and 3
- (C) 16, 6 and 3 (D) 15, 6 and 2

Q-44 Which of the following oxides is amphoteric in character?

- (A) SnO_2 (B) CO_2 (C) SiO_2 (D) CaO

Q-45 Given below are two statements labelled as Assertion (A) and Reason ®

Assertion : The empirical mass of ethene is half of its molecular mass.

Reason : The empirical formula represents the simplest whole number ratio of various atoms present in a compound.

Select the most appropriate answer from the options given below:

- (A) Both A and R are true and R is the correct explanation of A
- (B) Both A and R are true but R is not the correct explanation of A.
- (C) A is true but R is false.
- (D) A is false but R is true.

Q-46 Given below are two statements labelled as Assertion (A) and Reason ®

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.

Select the most appropriate answer from the options given below:

- (A) Both A and R are true and R is the correct explanation of A
- (B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

Q-47 Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion (A) : Sodium chloride formed by the action of chlorine gas on sodium metal is a stable compound.

Select the most appropriate answer from the options given below:

Reason (R) : This is because sodium and chloride ions acquire octet in sodium chloride formation.

(A) A and R both are correct, and R is the correct explanation of A.

(B) A and R both are correct, but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A and R both are false.

Q-48 Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion (A) : Though the central atom of both NH_3 and H_2O molecules are sp^3 hybridised, yet the $\text{H}-\text{N}-\text{H}$ bond angle is greater than that of $\text{H}-\text{O}-\text{H}$.

Reason (R) : This is because the nitrogen atom has one lone pair and oxygen atom has two lone pairs.

Select the most appropriate answer from the options given below:

(A) A and R both are correct, and R is the correct explanation of A.

(B) A and R both are correct, but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A and R both are false.

Q-49. Given below are two statements labelled as Assertion (A) and Reason (R)

Assertion (A): Among the two $\text{O}-\text{H}$ bonds in the H_2O molecule, the energy required to break the first $\text{O}-\text{H}$ bond and the other $\text{O}-\text{H}$ bond is the same.

Reason (R) : This is because the electronic environment around oxygen is the same even after breakage of one $\text{O}-\text{H}$ bond.

Select the most appropriate answer from the options given below

(A) A and R both are correct, and R is the correct explanation of A.

(B) A and R both are correct, but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A and R both are false.

SECTION C

This section consists of 6 multiple choice questions with an overall choice to attempt any 5. In case more than desirable number of questions are attempted, ONLY first 5 will be considered for evaluation.

Q-50 Which of the following is not an example of redox reaction?

(A) $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$

(B) $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$

(C) $2\text{K} + \text{F}_2 \rightarrow 2\text{KF}$

(D) $\text{BaCl}_2 + \text{H}_2\text{SO}_4 \rightarrow \text{BaSO}_4 + 2\text{HCl}$

Q-51 Using the standard electrode potential, find out the pair between which redox reaction is not feasible.

- (A) Fe^{3+} and I^-
- (B) Ag^+ and Cu
- (C) Fe^{3+}
- (D) Ag and Fe^{3+}

Q-52 Match the following items in column I with the corresponding items in column II.

Column I

Column II

- (i) $\text{Na}_2\text{CO}_3 \cdot 5\text{H}_2\text{O}$. (A) Portland cement ingredient
- (ii) $\text{Mg}(\text{HCO}_3)_2$. (B) Castner Kellner Process
- (iii) NaOH (C) Solvay process
- (iv) $\text{Ca}_3\text{Al}_2\text{O}_6$. (D) Temporary hardness

(A) (i) \rightarrow (C); (ii) \rightarrow (B); (iii) \rightarrow (D); (iv) \rightarrow (A)

(B) (i) \rightarrow (C); (ii) \rightarrow (D); (iii) \rightarrow (B); (iv) \rightarrow (A)

(C) (i) \rightarrow (D); (ii) \rightarrow (A); (iii) \rightarrow (B); (iv) \rightarrow (C)

(D) (i) \rightarrow (B); (ii) \rightarrow (C); (iii) \rightarrow (A); (iv)

CASE1: Read the passage given below and answer the following questions 53-55

Molecular orbitals are formed by the overlap of atomic orbitals. Two atomic orbitals combine to form two molecular orbitals called bonding molecular orbital (BMO) and anti bonding molecular orbital (ABMO). Energy of anti bonding orbital is raised above the parent atomic orbitals that have combined and the energy of the bonding orbital is lowered than the parent atomic orbitals. Energies of various molecular orbitals for elements hydrogen to nitrogen increase in the order : Different atomic orbitals of one atom combine with those atomic orbitals of the second atom which have comparable energies and proper orientation. Further, if the overlapping is head on, the molecular orbital is called 'Sigma', (σ) and if the overlap is lateral, the molecular orbital is called 'pi', (π). The molecular orbitals are filled with electrons according to the same rules as followed for filling of atomic orbitals. However, the order for filling is not the same for all molecules or their ions. Bond order is one of the most important parameters to compare the strength of bonds.

Q-53 Which of the following statements is correct?

- (A) In the formation of dioxygen from oxygen atoms 10 molecular orbitals will be formed.
- (B) All the molecular orbitals in the dioxygen will be completely filled.
- (C) Total number of bonding molecular orbitals will not be the same as the total number of anti bonding orbitals in dioxygen.
- (D) Number of filled bonding orbitals will be the same as number of filled antibonding orbitals.

Q-54 Which of the following molecular orbitals has the maximum number of nodal planes?

- (A) σ^*1s
- (B) σ^*2p_z
- (C) $\pi 2p_x$
- (D) π^*2p_y

Q-55 Which of the following pair is expected to have the same bond order?

- (A) O_2 , N_2

- (B) O_2^+ , N_2^-
- (C) O_2^- , N_2^+
- (D) O_2^- , N_2^-

SUDITI GLOBAL ACADEMY MAINPURI
SYLLABUS OF CLASS 11TH CHEMISTRY
FOR PERIODIC TEST

Chapter-1 Some basic concepts of chemistry

Chapter-2 Structure of atom