Chemistry 1st Year Solved MCQ,S

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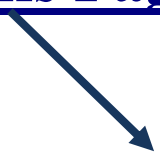

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1ST-CHAPTER-BASIC-CONCEPTS-MCQs_2.pdf

2-CHAPTER-EXPERIMENTAL-TECHNIQUES-IN-CHEMISTRY-MCQS.pdf

3RD-Chapter-GASES-MCQs.pdf

4-Chapter-LIQUIDS-AND-SOLIDS-MCQs.pdf

5-CHAPTER-ATOMIC-STRUCTURE-MCQs.pdf

6-CHAPTER-CHEMICAL-BONDING-MCQs.pdf

7-CHAPTER-THERMOCHEMISTRY-MCQs.pdf

8-CHAPTER-CHEMICAL-EQUILIBRIUM-MCQs.pdf

9-CHAPTER-SOLUTIONS-MCQs.pdf

10-CHAPTER-ELECTROCHEMISTRY-MCQS.pdf

11-CHAPTER-REACTION-KINETICS-MCQS.pdf

Chapter No. 1

BASIC CONCEPTS

MCQs

Q.1 *Smallest particle of an element which may or may not have independent existence*

(a) a molecule (b) an atom
(c) an ion (d) an electron

Q.2 *Swedish chemist J. Berzelius determined the*

(a) atomic no. (b) atomic volume
(c) atomic mass (d) atomic density

Q.3 *The number of atoms present in a molecule determine its*

(a) molecularity (b) basicity
(c) acidity (d) atomicity

Q.4 *When an electron is added to a unipositive ion we get*

(a) anion (b) cation
(c) neutral atom (d) molecule

Q.5 *CO+ is an example of:*

(a) free radical (b) cationic molecular ion
(c) an ionic molecular ion
(d) stable molecule

Q.6 *Relative atomic mass is the mass of an atom of an element as compared to the mass of*

(a) oxygen (b) hydrogen
(c) nitrogen (d) carbon

Q.7 *Isotopes are the sister atoms of the same element with similar chemical properties and different*

(a) atomic number (b) atomic mass
(c) atomic volume (d) atomic structure

Q.8 *The instrument which is used to measure the exact masses of different isotopes of an element called*

(a) I.R. Spectrophotometer (b) U.V. Spectrophotometer
(c) Mass Spectrometer (d) Colourimeter

Q.9 *Mass spectrometer separates different positive isotopic ions on the basis of their*

(a) mass value (b) m/e value
(c) e/m value (d) change value

Q.10 ***Simplest formula that gives us information about the simple ratio of atoms in a compound is called***

(a) structural formula (b) molecular formula
(c) empirical formula (d) molar ratio

Q.11 ***Percentage of oxygen in H2O is***

(a) 80% (b) 88.8%
(c) 8.8% (d) 9.8%

Q.12 ***More abundant isotope of an element is one with***

(a) even atomic no. (b) odd atomic no.
(c) Even mass no. (d) odd mass no.

Q.13 ***Large no. of isotopes are known for the elements whose masses are multiple of***

(a) two (b) four
(c) six (d) eight

Q.14 ***When 0.01 kg of CaCO3 is decomposed the CO2 produced occupies a volume at S.T.P.***

(a) 2.2414 dm3 (b) 22.414 dm3
(c) 22414 dm3 (d) 224014 dm3

Q.15 ***The no. of covalent bond in 10gm of NH3 are***

(a) 6.022 x 1023 (b) 1.062 x 1023
(c) 10.62 x 1024 (d) 1.062 x 1024

Q.16 ***No. of molecules present in 10gm of water are***

(a) 3.37 x 1023 (b) 33.7 x 1023
(c) 3.37 x 1024 (d) 3.037 x 1024

Q.17 ***The no. of covalent bonds present in 10gm of water are***

(a) 6.074 x 1023 (b) 6.74 x 1023
(c) 6.074 x 1024 (d) 6.74 x 1024

Q.18 ***The least no. of molecules present in 30 gm of***

(a) N2O (b) NO
(c) NO2 (d) N2O3

Q.19 ***Which of the following has highest percentage of nitrogen***

(a) (NH4)2SO4 (b) NH4H2PO4
(c) (NH4)2HPO4 (d) (NH4)3PO4

Q.20 ***0.1 mole of Na3PO4 completely dissociates in water to produce Na+***

(a) 6.02 x 1022 (b) 6.02 x 1023
(c) 1.806 x 1023 (d) 1.806 x 1022

Q.21 ***Efficiency of chemical reaction can be checked by calculating***

(a) amount of limiting reactant
(b) amount of the reactant in excess
(c) amount of the product formed

(d) amount of the reactant unused

Q.22 A limiting reactant is one

(a) which is present in least amount
(b) which produces minimum no. of moles of product
(c) which produces maximum no. of moles of product
(d) does not effect the amount of product

Q.23 Stoichiometry is the branch of chemistry which deals with the study of quantitative relationship among the various

(a) reactants (b) products
(c) Reactants and products (d) all of above

Q.24 500 cm3 of H2 gas at STP contradictions of hydrogen

(a) 6.02 x 1023 (b) 3.01 x 1022
(c) 2.68 x 1022 (d) 1.34 x 1022

Q.25 Largest number of H+ ions are produced by complete ionization of

(a) 0.01 mole of HCl (b) 0.0050 mole of H2SO4
(c) 0.000334 moles of H3PO4
(d) all above

Q.26 The Avogadro's number is

(a) 6.02 x 1024 (b) 6.02 x 10–24
(c) 6.02 x 10–23 (d) 6.02 x 1023

Q.27 The largest number of H+ are produced by complete ionization of

(a) 0.100 2 moles of HCl (b) 0.051 moles of H2SO4
(c) 0.0334 moles of H3PO4 (d) All of the above

Q.28 A sample of pure matter is

(a) element (b) compound
(c) substance (d) mixture

Q.29 nm stands for

(a) Newton meter (b) Nanometer
(c) Newton square meter (d) none of the above

Q.30 One calorie is equal to

(a) 4.184 J (b) 41.84 J
(c) 0.4184 J (d) 0.04184 J

Q.31 The number of moles of CO2 which contains 8.0 gm of oxygen

(a) 0.25 (b) 0.50
(c) 1.0 (d) 1.50

Q.32 27 grams of Al will react completely with how much mass of O2 to produce Al2O3

(a) 8 gm of oxygen (b) 16 gm of oxygen
(c) 32 gm of oxygen (d) 24 gm of oxygen

Q.33 Mole of SO2 contains

(a) 6.02 x 1023 atoms of oxygen
(b) 18.1 x 1023 molecules of SO2
(c) 6.023 x 1023 atom of sulphur
(d) 4 gram of SO2

Q.34 The largest number of molecules are presenting
(a) 3.6 gram of H2O (b) 4.8 gram of C2H5OH
(c) 2.8 gm of CO (d) 5.4 gms of N2O5

Q.35 The mass of one mole of electron is
(a) 1.008 mg (b) 0.184 mg
(c) 1.673 mg (d) 0.55 mg

Q.36 Isotopes differ in
(a) properties which depend on mass
(b) arrangements of electrons in orbital
(c) chemical properties
(d) the extent to which they may be affected in electromagnetic field

Q.37 The volume occupied by 1.4 gm of N2 at STP is
(a) 224 dm3 (b) 22.4 dm3
(c) 1.12 dm3 (d) 112 cm3

Q.38 Many elements have fractional atomic mass. This is because
(a) the mass atom is itself fractional
(b) atomic masses are average masses of isobars
(c) atomic masses are averages masses of isotopes
(d) atomic masses are average masses of isotopes proportional to relative abundance

Q.39 A limiting reactant is one which
(a) is taken in lesser quantity in grams as compared to other reactants
(b) is taken in lesser quantity in volume as compared to the other
(c) gives the maximum amount of the product which is required
(d) gives the minimum amount of the product under consideration

Q.40 Isotopes when even atomic masses are a comparatively abundant
(a) demper's spectrograph is superior to that of Aston's
(b) 0.1 mg of H2O has greater number of molecules then 0.1 mg of CH4
(c) the number of H+ and PO–3 ions are not equal but the number of positive and negative charges
(d) are equal when 100 molecules of H3PO4 are thrown in excess of water

Q.41 ***A molecule having two atoms is called***

(a) monoatomic molecules (b) diatomic molecules

(c) Polyatomic molecules (d) homoatomic molecule

Q.42 ***An ordinary misoscope is used to measure the object of size***

(a) upto 500 nm (b) upto 850 nm

(c) upto 1000 nm (d) upto 1200 nm

Q.43 ***1 atomic masses unit (amu) is equation***

(a) 1.66 x 10–27 kg (b) 1.56 x 10–27 kg

(c) 1.76 x 10–21 kg (d) 1.8 x 10–27 kg

Q.44 ***Nickel has isotopes***

(a) 1 (b) 3

(c) 5 (d) 7

Q.45 ***Cadmium has isotopes***

(a) 3 (b) 5

(c) 7 (d) 9

Q.46 ***The pressure of vapours in the separating isotopes by mass spectrometry is kept at***

(a) 10–6 torr (b) 10–4 torr

(c) 10–3 torr (d) 10–5 torr

Q.47 ***Number of gram atoms in 0.1 gm of Na is***

(a) 0.0043 (b) 0.0403

(c) 0.403 (d) None of these

Q.48 ***Molecule of haemoglobin contains atoms***

(a) 15,000 (b) 12,000

(c) 10,000 (d) 8,000

Q.49 ***Haemoglobin is heavier than a hydrogen atom***

(a) 65,000 (b) 68,000

(c) 62,000 (d) 60,000

Answers

Questions	1	2	3	4	5
Answers	b	C	d	c	b
Questions	6	7	8	9	10
Answers	d	b	c	b	c
Questions	11	12	13	14	15
Answers	b	c	b	a	d
Questions	16	17	18	19	20

Answers	a	b	d	d	c
Questions	21	22	23	24	25
Answers	c	b	d	c	d
Questions	26	27	28	29	30
Answers	d	d	a	b	a
Questions	31	32	33	34	35
Answers	a	d	c	a	d
Questions	36	37	38	39	40
Answers	a	c	d	d	c
Questions	41	42	43	44	
Answers	c	a	a	c	
Questions	45	46	47	48	49
Answers	d	a	a	c	b

Chapter No. 2

EXPERIMENTAL TECHNIQUES IN CHEMISTRY

MCQs

Q.1 Science of the chemical characterization is stand under the heading of

(a) industrial chemistry (b) experimental chemistry
(c) analytical chemistry (d) physical chemistry

Q.2 Several types of filter media are used for filtration depending on
(a) nature of reaction (b) nature of reactants
(c) nature of precipitate (d) nature of filter paper

Q.3 Filtration by a glass funnel and filter paper is very
(a) time consuming (b) difficult
(c) fast (d) accurate

Q.4 Date of filtration through conical funnel can be considerably increased by using
(a) fine filter paper (b) ordinary filter paper
(c) fluted filter (d) under suction crucible

Q.5 Gooch crucible is used to filter the solution of
(a) K2Cr2O7 (b) KMnO4
(c) KOH (d) under suction crucible

Q.6 Basic principles of crystallization is that solute should be soluble in a suitable solution at
(a) freezing temperature (b) room temperature
(c) high temperature (d) low temperature

Q.7 Premature crystallization of solution of filter paper or in funnel can be avoided
(a) filtering hot saturated solution using hot funnel
(b) filling warm solution
(c) quick filtration
(d) filtering cold solution

Q.8 Safe and reliable method of drying crystal in through
(a) pressing it between folds of filter paper

(b) drying it in oven
(c) evaporation of solution
(d) vacuum desiccator

Q.9 In solvent extraction solute can be separated from solution by shaking the solution with solvent which the solute is
(a) more soluble (b) partially soluble
(c) insoluble (d) soluble at high temperature

Q.10 Repeated extraction using small portions of solvent are more
(a) accurate (b) efficient
(c) slow (d) rapid

Q.11 To achieve a good separation the two liquids are gently shaken to increase their area of
(a) miscibility (b) separation
(c) contact (d) solubility

Q.12 Chromatography in which stationary phase is solid is called
(a) partition chromatography
(b) paper chromatography
(c) high pressure
(d) adsorption chromatography

Q.13 Chromatography involves these distribution of a solution between
(a) two stationary phase
(b) two mobile phase
(c) a stationary phase and a mobile phase
(d) two stationary and two mobile phase

Q.14 Chromatography in which the stationary phase is liquid is called
(a) partition chromatography
(b) descending chromatography
(c) column chromatography
(d) Adsorption chromatography

Q.15 In paper chromatography the rate at which solutes move depends on
(a) distribution law (b) distribution coefficients
(c) law of partial pressure (d) law of specific proportion

Q.16 Solvent extraction is an equilibrium process and it is controlled by
(a) law of mass action (b) the amount of solvent used
(c) distribution law (d) the amount of solute

Q.17 The comparative rates at which the solutes move in paper chromatography depend on

(a) the size of paper used
(b) Rf values of solutes
(c) temperature of the experiment
(d) size of the chromatographic tank used

Q.18 A filtration process could be very time consuming if it were not aided by the gentle suction, which is developed

(a) if the paper covers the funnel up to its circumference
(b) if the paper has got small sized pores in it
(c) if the stem of the funnel is large so that it dips into the filtrate
(d) if the paper fits tightly

Q.19 Solvent extraction method is particularly useful technique for separation, when product to be separated is

(a) non–volatile or thermally unstable
(b) volatile or thermally stable
(c) non volatile or thermally stable
(d) non–volatile or thermally unstable

Q.20 During the process of crystallization, the hot saturated solution

(a) is cooled very slowly to get large sized crystals
(b) is cooled at a moderate rate to get medium sized crystals
(c) is evaporated to get the pure crystals of the product
(d) is mixed with an immiscible liquid, to get the pure crystals of the product

Q.21 Aqueous solution of iodine is prepared first by dissolving which compound in water

(a) KBr (b) KI
(c) KCl (d) NaCl

Q.22 The meaning of chromatos

(a) colour writing (b) colour writing
(c) colour forming (d) colour spreading

Q.23 Which is not common way of carrying chromatography

(a) ascending (b) descending
(c) radial/circular (d) spreading irregularly

Q.24 In paper chromatography the stationary phase is

(a) water (b) organic liquid
(c) inorganic liquid (d) none of the above

Q.25 In paper chromatography the mobile phase is

(a) organic liquid (b) water
(c) inorganic liquid (d) none of the above

ANSWERS

Questions	1	2	3	4	5
Answers	c	c	a	c	b
Questions	6	7	8	9	10
Answers	c	a	d	a	b
Questions	11	12	13	14	15
Answers	c	d	c	a	b
Questions	16	17	18	19	20
Answers	c	b	d	d	b
Questions	21	22	23	24	25
Answers	b	a	d	a	a

Chapter 3rd

GASES
MCQs

Q.1 The order of the rate of diffusion of gases NH3, SO2, Cl2 and CO2 is:

(a) NH3 > SO2 > Cl2 > CO2
(b) NH3 > CO2 > SO2 > Cl2

(c) Cl2> SO2 > CO2 > NH3
(d) None of these

Q.2 Pressure remaining constant at which temperature the volume of gas will become twice of what it is at 0C.

(a) 546 oC (b) 200 oC
(c) 546 K (d) 273 K

Q.3 Equal masses of methane and oxygen are mixed in an empty container at 25oC. The fraction of the total pressure exerted by the oxygen is:

(a) (b)
(c) (d)

Q.4 Which of the following of will have the same number of molecules at STP?

(a) 280 cm3 of CO2 and 280 cm3 of N2O
(b) 11.2 dm3 of O2 and 32 g of O2

(c) 44g of CO2 and 11.2 dm3 of CO
(d) 28g of N2 and 5.6 dm3 of oxygen

Q.5 Number of molecules in one dm3 of water is close to:
(a) x 1023 (b) x 1023
(c) x 1023 (d) 55.6 x 6.02 x 1023

Q.6 If absolute temperature of a gas is doubled and the pressure is reduced to one half the volume of gas will.
(a) remain unchanged (b) increases four times
(c) reduce to (d) be double

Q.7 How should the conditions be changed to prevent the volume of a given mass of gas from expanding when its mass is increased
(a) temperature is lowered and pressure is increased
(b) temperature is increased and the pressure is lowered
(c) temperature and pressure both are lowered
(d) temperature and pressure both are increased

Q.8 The molar volume of CO2 is maximum at
(a) STP
(b) 127 oC and 1 atm
(c) 0 oC and 2 atm
(d) 273 oC and 2 atm

Q.9 Gases deviate from ideal behaviour at high pressure. Which of the following is correct for non–ideality?
(a) At high pressure, the gas molecules move in one direction only
(b) At high pressure, the collisions between, the gas molecules are increased manifold
(c) At high pressure, the volume of gas becomes insignificant
(d) AT high pressure, the intermolecular attractions, become significant

Q.10 The deviation of a gas from ideal behaviour is maximum at,
(a) – 10 oC and 5.0 atm (b) – 10 oC and 2.0 atm
(c) 100 oC and 2.0 atm (d) 0 oC and 2.0 atm

Q.11 At high temperature isotherm moves away from both the axis because of increase in,

(a) pressure (b) volume
(c) no. of moles (d) all above

Q.12 Values of Charle's law constant K depends upon.

(a) mass of gas (b) pressure gas
(c) no. of moles of gas (d) all above

Q.13 Equal volumes of H2 and He are inserted in the same vessel. The pressure exerted by H2 and He are in the ratio:

(a) 1:1 (b) 2:1
(c) 1:2 (d) all above

Q.14 Which of the following have same no. of molecules at STP

(a) 1000 cm3 of N2H4 and O2
(b) 200 cm3 of CO2 and N2O
(c) 50 cm3 each of CO and N2
(d) all above

Q.15 If absolute temperature is doubled and the pressure is increased 4 times. The volume is

(a) half (b) double
(c) four times (d) remains the changed

Q.16 Density of a gas is usually expressed in

(a) kg m3 (b) kg dm3
(c) g dm–3 (d) g cm–3

Q.17 Units of gas constant R in SI system is:

(a) 0.0821 dm3 atm k–1 mol–1
(b) 82.1 cm3 atm k–1
(c) 8.31 Nm k–1 mol–1
(d) 1.987 cal k–1 mol–1

Q.18 Concept of distribution of velocities among the gas molecules was developed by

(a) Claudius (b) Maxwell
(c) Boltzman (d) Vanderwaal

Q.19 Absolute temperature of gas is proportional to

(a) translational kinetic energy
(b) rotational kinetic energy
(c) vibrational kinetic energy
(d) potential energy

Q.20 Deviation a gas from ideal behaviour is maximum at
(a) low temperature, low pressure
(b) low temperature, high pressure
(c) high temperature, low pressure
(d) high temperature high pressure

Q.21 Most ideal gas at room temperature is:
(a) CO2 (b) NH3
(c) SO2 (d) N2

Q.22 22.414 dm3 of various ideal gases at STP will have Avogadro's number of molecules
(a) 6.02 x 1023 (b) 6.02 x 1024
(c) 0.602 x 1023 (d) 6.02 x 1022

Q.23 Gases are ideal at
(a) low pressure and high temperature
(b) low temperature and high pressure
(c) high pressure and high temperature
(d) low pressure and low temperature

Q.24 The value of compressibility factor for an ideal gas is equal to:
(a) 1 (b) 1.5
(c) 2 (d) 2.5

Q.25 An ideal gas obeys
(a) Boyle's law (b) Charle's law
(c) Avogadro's law (d) all above

Q.26 A real gas obeying Vander Waal's equation will resemble ideal gas if:
(a) both 'a' and 'b' are large
(b) both 'a' and 'b' are small
(c) 'a' is small and 'b' is large
(d) 'a' is large and 'b' is small

Q.27 Deep sea divers breath mixture of nitrogen and oxygen in a ratio of:

(a) 96% N2 and 4% O2 (b) 4% and N2 and 96% O2

(c) 80% N2 and 20% O2 (d) 20% N2 and 80% O2

Q.28 One mole of any gas at STP occupies volume

(a) 2.24 dm3 (b) 22.4 dm3

(c) 44.4 dm3 (d) 48.4 dm3

Q.29 K.E. of gas molecules is equal to:

(a) (b) m v2

(c) (d)

Q.30 All gases solidify before reaching at

(a) 373 oK (b) 273 oC

(c) – 473 oC (d) 0 oK

Q.31 Kinetic equation is equal to

(a) P V = n R T (b) P V = R T

(c) PV = m n c2 (d) PV = m n c2

Q.32 Root mean square velocity is equal to

(a) (b)

(c) (d)

Q.33 Kinetic energy associated with one molecule of a gas due to translational motion is given by

(a) EK = (b) Ek = m v2

(c) Ek = m n c2 (d) Ek =

Q.34 Density of gas is usually expressed as

(a) kg m–3 (b) kg dm–3

(c) g dm–3 (d) g cm–3

Q.35 Weight of one dm3 of O2 at STP is

(a) 1.4384 gm (b) 1.4394 gm

(c) 1.6384 gm (d) 1.3384 gm

ANSWERS

Question	1	2	3	4	5

s					
Answers	b	c	a	a	a
Questions	6	7	8	9	10
Answers	b	a	b	d	a
Questions	11	12	13	14	15
Answers	b	d	a	d	a
Questions	16	17	18	19	20
Answers	c	c	b	a	b
Questions	21	22	23	24	25
Answers	d	a	a	a	d
Questions	26	27	28	29	30
Answers	b	a	b	d	d
Questions	31	32	33	34	35
Answers	c	a	a	c	a

Chapter 4rth

LIQUIDS AND SOLIDS

MCQs

Q.1 Ionic solids are characterized by

(a) low melting points

(b) good conductivity in solid state

(c) high vapour pressure

(d) solubility in polar solvents

Q.2 Amorphous solids.

(a) have sharp melting points

(b) undergo clean cleavage when cut with knife

(c) have perfect arrangements of atoms

(d) can presses small regions of orderly arrangements of atoms

Q.3 The force of attraction between the atoms of helium is

(a) hydrogen bonding

(b) coordinate covalent bond

(c) covalent bond

(d) london dispersion force

Q.4 **Which of the following is a pseudo-solid**

(a) CaF2 (b) Glass

(c) NaCl (d) All

Q.5 Diamond is a bad conductor because

(a) It has a tight structure (b) It has a high density

(c) There is no free electron present in the crystal of diamond to conduct electricity

(d) None of the above

Q.6 The weakest intermolecular for a
(a) dipole–dipole force
(b) electrostatic force between ions
(c) ion–dipole force
(d) dipole–induced dipole force

Q.7 In liquids intermolecular forces are
(a) very weak (b) very strong
(c) reasonably strong (d) ion–dipole force

Q.8 Values of heat of vaporization for liquids, with strong dipole–dipole forces will be
(a) very high (b) very low
(c) reasonably high (d) negligible

Q.9 Instantaneous dipole–induced dipole force is also called
(a) dipole force (b) london dispersion
(c) hydrogen bonding (d) none of the above

Q.10 Down the group polarizability generally
(a) increases (b) decreases
(c) remains constant (d) do not follow a regular trend

Q.11 Trend of boiling points of halogens from fluorine to iodine is that it.
(a) decreases (b) increases
(c) remains constant (d) negligible

Q.12 Molecules of hydro carbons with large chain lengths experience
(a) repulsive forces (b) strong attractive force
(c) weaker attractive forces
(d) no attractive force

Q.13 Hydrocarbons which generally have high molecular masses exist is.
(a) solid form (b) liquid form
(c) vapour form (d) gaseous form

Q.14 Exceptionally low acidic strength of HF is due to
(a) strong polar bond (b) small size of fluorine
(c) strong hydrogen bonding (d) Vander Waal's forces

Q.15 Long chain of amino acids are coiled about one another into spiral by.

(a) covalent bond (b) ionic bond
(c) hydrogen bond (d) Vander Waal's forces

Q.16 Evaporation of water is possible at

(a) 100oC (b) 0oC
(c) at all temperatures (d) above 100oC

Q.17 Boiling point is low for liquid with

(a) high vapour pressure at given temperature
(b) low vapour pressure at a given temperature
(c) very high vapour pressure
(d) very low vapour pressure

Q.18 At equilibrium rate of evaporation and rate of condensation

(a) become very high (b) become very low
(c) can never be equal (d) become equal

Q.19 In an open system vapour pressure of water at 100oC at sea level is

(a) 700 mm of Hg (b) 760 mm of Hg
(c) 670 mm of Hg (d) 1000 mm of Hg

Q.20 Molar heat of vaporization of water is

(a) 140.6 kJ/mol (b) 14.06 kJ/mol
(c) 18 kJ/mol (d) 40.6 kJ/mol

Q.21 **When external pressure is 23.7 torr boiling point of water is**

(a) 100oC (b) 200oC
(c) 98oC (d) 25oC

Q.22 Distillation under very reduced pressure is called

(a) fractional distillation (b) distillation
(c) vacuum destructive distillation
(d) destructive distillation

Q.23 Water may boil at 120oC when external pressure is

(a) 760 torr (b) 100 torr
(c) 1489 torr (d) 700 torr

Q.24 Amount of heat absorbed when one mole of solid melts into liquid form at its melting point is called

(a) molar heat of sublimation
(b) heat of vaporization
(c) latent heat of fusion
(d) molar heat of fusion

Q.25 Ethanol is much more soluble in water than ethyl ethanuate which one of the following statement correctly account for this

(a) ethanol is polar molecule but ethyl ethanoate is non–polar
(b) ethanol is non polar molecule but ethyl ethanoate is polar
(c) a hydrogen bond is formed between H–atom of the OH group in ethanol and O–atom of water molecule
(d) a hydrogen bond is formed between the H–atom of the OH group in ethanol and hydrogen of the water molecule

Q.26 The boiling point of a liquid will be

(a) lower at high altitude
(b) higher at high altitude
(c) same at sea level and high altitudes
(d) equal to atmospheric pressure

Q.27 The process in which liquids can be made to boil at low temperature is called

(a) vacuum distillation
(b) destructive distillation
(c) distillation
(d) vacuum destructive distillation

Q.28 Why is the boiling point of methane greater than that of neon

(a) a molecule of methane has a greater mass
(b) a molecule of methane has more electrons than a molecule of neon
(c) the molecules of methane have stronger intermolecular forces than those of neon
(d) the molecule of methane is polar but that of neon is not

Q.29 The amount of heat required to vaporize one mole of a liquid at its boiling point is called

(a) molar heat of vaporization
(b) molar heat of fusion
(c) latent heat of fusion
(d) molar heat of sublimation

Q.30 Which of the elements in its crystalline form will have the lowest enthalpy change of vaporizations

(a) chlorine (b) argon
(c) phosphorous (d) silicon

Q.31 Crystals show variation in physical properties depending upon the direction. The property is called

(a) isomorphism (b) polymorphism
(c) anisotropy (d) isotropy

Q.32 Certain melt to a turbid liquid phase with properties of liquids as well as some degree of order like solid. Such turbid liquids are called

(a) anorphous solid (b) vitreous solid
(c) crystalline solid (d) liquid crystal

Q.33 Isomorphous crystals show

(a) same chemical properties
(b) same physical properties
(c) same crystalline form
(d) same melting point

Q.34 Existence of an element in more than form is known as

(a) allotropy (b) isomorphism
(c) isotropy (d) none of these

Q.35 Crystalline forms of the same, substance can coexist in equilibrium with each other at its

(a) melting point (b) transition temperature
(c) boiling point (d) none of these

Q.36 Crystal lattice of substance can be catagorised into

(a) five types (b) seven types
(c) six types (d) none of these

Q.37 Covalent solids are composed of

(a) ions (b) different molecules

(c) neutral atoms (d) any of the above

Q.38 Carbon atoms of diamond are

(a) sp hybridized (b) sp2 hybridized

(c) sp3 hybridized (d) unhybridized

Q.39 Molecular crystals are generally

(a) hard (b) soft

(c) unstable (d) stable

Q.40 Ionic crystals are

(a) hard (b) soft

(c) brittle (d) amorphous

ANSWER

Questions	1	2	3	4	5
Answers	d	d	d	b	c
Questions	6	7	8	9	10
Answers	d	c	c	b	a
Questions	11	12	13	14	15
Answers	b	b	a	c	c
Questions	16	17	18	19	20
Answers	a	c	d	b	d
Questions	21	22	23	24	25
Answers	d	c	c	d	c
Questions	26	27	28	29	30
Answers	a	a	c	a	b
Questions	31	32	33	34	35
Answers	c	d	c	a	b
Questions	36	37	38	39	40
Answers	b	c	c	b	a

CHAPTER 5

ATOMIC STRUCTURE
MCQs

Q.1 Splitting of spectral lines when atoms are subjected to strong electric field is called

(a) Zeeman effect (b) Stark effect
(c) Photoelectric effect (d) Compton effect

Q.2 The velocity of photon is

(a) independent of its wavelength
(b) depends on its wavelength
(c) equal to square of its amplitude
(d) depends on its source

Q.3 The nature of positive rays depend on

(a) the nature of electrode
(b) the nature of discharge tube
(c) the nature of residual gas
(d) all of the above

Q.4 The wave number of the light emitted by a certain source is 2 x 106 m. The wavelength of this light is

(a) 500 nm (b) 500 m
(c) 200 nm (d) 5 x 10–1 m

Q.5 Rutherford's model of atom failed because

(a) the atom did not have a nucleus and electrons
(b) it did not account for the attraction between protons and neutrons
(c) it did account for the stability of the atom
(d) there is actually no space between the nucleus and the electrons

Q.6 Bohr's model of atom is contradicted by

(a) Planck's quantum theory
(b) Pauli exclusion principle
(c) Heisenberg uncertainty principle

(d) All of the above

Q.7 Quantum number value for 2p orbitals are

(a) n = 2, l = 1 (b) n = 1, l = 2

(c) n = 1, l = 0 (d) n = 2, l = 0

Q.8 In the ground state of an atom, the electron is present

(a) in the nucleus (b) in the second shell

(c) nearest to the nucleus (d) farthest from the nucleus

Q.9 When the 6d orbital is complete the entering electron goes into

(a) 7f (b) 7s

(c) 7p (d) 7d

Q.10 Orbitals having same energy are called

(a) hybrid orbitals (b) valence orbitals

(c) degenerate orbitals (d) d–orbitals

Q.11 The e/m value for the positive rays is maximum for

(a) hydrogen (b) helium

(c) nitrogen (d) oxygen

Q.12 Neutron was discovered by Chadwick in

(a) 1935 (b) 1930

(c) 1932 (d) 1934

Q.13 The velocity of photon is

(a) equal to square of its amplitude

(b) independent of its wavelength

(c) Equal to its wave number

(d) equal to the velocity of light

Q.14 Quantum number values for 3p orbitals are

(a) n = 0, l = 3 (b) n = 3, l = 1

(c) n = 2, l = 1 (d) n = 1, l = 3

Q.15 The radius of first orbit of hydrogen atom

(a) 0.329 Ao (b) 0.429 Ao

(c) 0.529 Ao (d) 0.229 Ao

Q.16 All atoms are principally composed of few fundamental particles which are in number

(a) 2 (b) 3

(c) 4 (d) 5

Q.17 Which scientist gave the name of electron to the cathode rays

(a) Planck (b) Einstein

(c) Stoney (d) Bohr

Q.18 The divisibility of atom was showed by

(a) Stoney (b) J.J. Thomson

(c) Millikan (d) Rutherford

Q.19 The nature of cathode rays remains the same irrespective of the material used for

(a) gas (b) cathode

(c) glass (d) electrode

Q.20 Mass of electron is

(a) 9.1 x 10–31 kg (b) 9.109 x 10–32 gm

(c) 8.1 x 10–31 g (d) 9.1 x 10–31 mg

Q.21 The charge on an electron is

(a) 1.602 x 10–19 c (b) 1.602 x 10–18 c

(c) 1.602 x 10–19 c (d) 1.602 x 10–21 c

Q.22 The charge on the proton is

(a) + 1.602 x 10–19 c (b) zero

(c) – 1.602 x 1019 c (d) 1.602 x 10–19 c

Q.23 The charge on the neutron is

(a) 1.602 x 10–19 c (b) zero

(c) – 1.602 x 10–19 c (d) + 1.602 x 10–19 c

Q.24 The calculated e/m value of electron is

(a) 1.602 x 1019 c kg–1 (b) 1.7588 x 10–11 c kg–1

(c) 1.7588 x 10–13 c kg–1 (d) 1.759 x 109 c kg

Q.25 The mass of proton is

(a) 9.11 x 10–31 kg (b) 1.676 x 10–27 kg

(c) 1.60 x 10–19 kg (d) 1.675 x 10–27 kg

Q.26 The mass of neutron is

(a) 1.675 x 10–27 kg (b) 1.675 x 10–25 kg

(c) 9.11 x 10–31 kg (d) 1.60 x 10–19 kg

Q.27 The charge on electron was determined by

(a) J.J. Thomson (b) Millikan
(c) Rutherford (d) Bohr

Q.28 Alpha particles are identical to
(a) hydrogen atoms (b) helium atoms
(c) helium nuclei (d) fast moving electrons

Q.29 Bombardment of Beryllium with alpha particles generates
(a) proton (b) neutron
(c) electron (d) positron

Q.30 The colour of the glow produced in the discharge tube depends upon
(a) gas (b) electrodes
(c) composition of gas (d) pressure

Q.31 When the pressure of the gas in discharge tube is reduced, which of the following becomes more prominent
(a) gas glows (b) gas ionizes
(c) a discharge takes place (d) gas conducts electricity

Q.32 Goldstein discovered that besides the cathode rays, another type of rays are produced in the discharge tube which are called
(a) alpha rays (b) beta rays
(c) positive rays (d) gamma rays

Q.33 The e/m value for the positive rays in the discharge tube depends upon
(a) nature of electrode use
(b) nature of gas used
(c) composition of the gas
(d) pressure

Q.34 The distance between the two adjacent crests or troughs is called
(a) wave number (b) frequency
(c) wavelength (d) amplitude

Q.35 The value of Planck's constant "h" is
(a) 6.625 x 10–34 cal (b) 6.625 x 10–34 J sec
(c) 6.625 x 10–34 kJ (d) 6.625 x 10–34 k cal

Q.36 In the Bohr's model of atom the electron in an energy level emits or absorbs energy only when it

(a) remains in the same energy level
(b) dies out
(c) changes its energy level
(d) jumps away

Q.37 The energy associated with an electron resolving in first orbit is

(a) – 2.178 x 10–18 k J/mol
(b) – 1313.31 k J/mol
(c) – 328.32 k J/mol
(d) – 82.08 k J/mol

Q.38 The regions of spectrum are

(a) three (b) seven
(c) eight (d) five

Q.39 The dispersion of the components of white light when it is passed through prism is called

(a) rainbow (b) light pattern
(c) refraction (d) spectrum

Q.40 Which of the following colours has the shortest wavelength in the visible spectrum of light

(a) red (b) blue
(c) violet (d) green

Q.41 Which of the following colours has the longest wavelength in the visible spectrum of light

(a) red (b) blue
(c) violet (d) green

Q.42 A spectrum containing wavelength of all wavelengths is called

(a) continuous (b) discontinuous
(c) line (d) atomic

Q.43 A spectrum showing only certain colours of light is called

(a) continuous (b) line
(c) discontinuous (d) band

Q.44 The wavelength range of visible spectrum is

(a) 400–750 nm (b) 300–400 nm
(c) 350–600 nm (d) 200–400 nm

Q.45 The spectral lines of Lyman series (uv region) are produced when electron jumps from higher orbit to
(a) 1st orbit (b) 2nd orbit
(c) 3rd orbit (d) 4th orbit

Q.46 The spectral lines of Balmer series (visible region) are produced when electron jumps from higher orbit to
(a) 1st orbit (b) 2nd orbit
(c) 3rd orbit (d) 4th orbit

Q.47 The spectral lines of Paschen series (visible region) are produced when electron jumps from higher orbit to
(a) 1st orbit (b) 2nd orbit
(c) 3rd orbit (d) 4th orbit

Q.48 The spectral lines of Bracket series (visible region) are produced when electron jumps from higher orbit to
(a) 1st orbit (b) 2nd orbit
(c) 3rd orbit (d) 4th orbit

Q.49 A dual character of matter particles in motion was postulated by
(a) De–Broglie (b) Planck
(c) Einstein (d) Schrodinger

Q.50 If an electron is moving with a velocity of 2.188 x 106 m/s then its wavelength will be
(a) 0.33 x 106 nm (b) 0.33 x 10–2 nm
(c) 0.33 nm (d) 0.22 nm

Q.51 If a stone of 1gm is many with a velocity of 10m/s then its wavelength will be
(a) 6.65 x 10–30 m (b) 6.65 x 10–25 m
(c) 6.65 x 10–28 m (d) 6.65 x 10–12 m

Q.52 The space around the nucleus where the probability of finding the electron is maximum is called
(a) an orbital (b) an orbit
(c) energy level (d) a shell

Q.53 Which orbital has dumb–bell shape

(a) s–orbital (b) p–orbital
(c) d–orbital (d) f–orbital

Q.54 Which of the following quantum numbers describes energy of an electron in an atom

(a) principal quantum (b) azimuthal quantum
(c) magnetic quantum (d) spin quantum

Q.55 Which of the following quantum numbers describes shape of an electron in an atom

(a) principal quantum (b) azimuthal quantum
(c) magnetic quantum (d) spin quantum

Q.56 The degenerate orbital in p–subshell is

(a) 2 (b) 3
(c) 5 (d) 7

Q.57 When 4p orbital is complete the entering electron goes into

(a) 4d (b) 4f
(c) 5s (d) 5p

Q.58 x + *l* value for 3d will be

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

Q.59 Maximum number of electrons in 3f orbitals is

(a) 2 (b) zero
(c) 6 (d) 14

Q.60 Maximum number of electrons in M–shell is

(a) 2 (b) 8
(c) 18 (d) 32

Q.61 An orbital can have maximum electrons

(a) 2 (b) 8
(c) 18 (d) 6

Q.62 n + *l* value for 4f will

(a) 2 (b) 5
(c) 7 (d) 9

Q.63 When a spectrum of light is formed by the radiation given off by a substance it is called

(a) line spectrum (b) continuous spectrum
(c) emission spectrum (d) absorption spectrum

Q.64 Neutron was discovered by

(a) Chadwick (b) Bohr
(c) J.J. Thomson (d) Einstein

Q.65 Cathode rays can drive a small paddle wheel which shows that they

(a) are positively charged
(b) possess momentum
(c) do not possess momentum
(d) none of these

Q.66 Slow neutrons are generally more effective than fastness for the purpose of

(a) effusion (b) fission
(c) penetration (d) absorption

Q.67 The wavelength associated with the moving stone

(a) can be measured by many methods
(b) cannot be measured by any method
(c) can be measure by some method
(d) none of these

Q.68 Radius of orbit of an electron and velocity of electron are

(a) directly proportional to each other
(b) inversely proportional to each other
(c) independent to each other
(d) none of these

Q.69 The values of magnetic quantum number give us information about the number of orbitals in a

(a) small shell (b) orbit
(c) subshell (d) none of these

Q.70 Which of the following terms are used for the number of positive charges on the nucleus of an atom

(a) atomic number (b) atomic mass
(c) nuclear charge (d) atomic charge

Q.71 The uncertainty principle was stated by
(a) de Broglie (b) Heinsenberg
(c) Einstein (d) Schrodinger

Q.72 When a pressure in a discharge tube is reduced, which of the following phenomenon becomes very prominent
(a) gas conducts electricity
(b) a discharge takes place
(c) gas ionizes
(d) gas glows

Q.73 Atom bomb is based on the principle of
(a) nuclear fusion
(b) nuclear fission
(c) fusion and fission both
(d) radioactivity

Q.74 A spinning electron creates
(a) magnetic field (b) electric field
(c) quantum field (d) none of these

Q.75 The volume of space in which there is 95% chance of finding an electron is
(a) orbit (b) atomic orbital
(c) degenerate orbital (d) quantized orbital

Q.76 Planck's equation is
(a) E = mc2 (b) E = hv
(c) E = hv2 (d) E = mc

Q.77 In an atom, the electrons
(a) are stationary in various energy levels
(b) are distributed in three dimensional charge cloud around the nucleus
(c) embedded in space around the nucleus
(d) revolve around the nucleus at random

Q.78 The mass number of an element is equal to

(a) number of electrons in an atom
(b) number of protons and neutrons in the nucleus
(c) number of protons in the nucleus
(d) number of neutrons in the nucleus

Q.79 The energy of bounded electron in H atom is
(a) positive (b) negative
(c) zero (d) none of these

Q.80 Quantum number which has symbol "n" is called
(a) principal quantum (b) Azimuthal quantum
(c) Spin quantum (d) Magnetic quantum

ANSWERS

Questions	1	2	3	4	5
Answers	b	a	c	a	c
Questions	6	7	8	9	10
Answers	c	a	c	c	c
Questions	11	12	13	14	15
Answers	a	c	d	b	c
Questions	16	17	18	19	20
Answers	b	c	b	d	a
Questions	21	22	23	24	25
Answers	c	a	b	b	b
Questions	26	27	28	29	30
Answers	a	b	c	b	c
Questions	31	32	33	34	35
Answers	c	c	b	c	b

Questions	36	37	38	39	40
Answers	c	b	c	d	c
Questions	41	42	43	44	45
Answers	a	a	b	a	a
Questions	46	47	48	49	50
Answers	b	c	d	a	c
Questions	51	52	53	54	55
Answers	a	a	b	a	b
Questions	56	57	58	59	60
Answers	b	c	c	b	c
Questions	61	62	63	64	65
Answers	a	c	c	a	b
Questions	66	67	68	69	70
Answers	b	b	b	c	a
Questions	71	72	73	74	75
Answers	b	b	b	a	b
Questions	76	77	78	79	80
Answers	b	b	b	b	a

CHAPTER 6

CHEMICAL BONDING

MCQs

Q.1 An ionic compound A+ B– is most likely to be formed when

(a) The ionization energy of A is high and electron affinity of B is low

(b) The ionization energy of A is low and electron affinity of B is high

(c) Both the ionization energy and electron affinity of B are high

(d) Both the ionization energy of A and electron affinity of B are low

Q.2 The number of bonds in nitrogen molecules

(a) one σ and one π

(b) one σ and two π

(c) three sigma only

(d) two σ and one π

Q.3 Which of the following statements is not correct regarding bonding molecular orbitals?

(a) bonding molecular orbitals possess less energy than atomic orbitals from which they are formed

(b) bonding molecular orbitals have low electron density between the two nuclei

(c) every electron in the bonding molecular orbitals contributes to the attraction between atoms

(d) bonding molecular orbitals are formed when the electron waves undergo constructive interference

Q.4 Which of the following molecules has zero dipole moment?

(a) NH3 (b) CHCl3

(c) H2O (d) BF3

Q.5 Which of the hydrogen halides has the highest percentage of ionic character

(a) HF (b) HBr
(c) HCl (d) HI

Q.6 Which of the following molecules has unpaired electrons in anti–bonding molecular orbitals
(a) O2 (b) N2
(c) Br2 (d) F2

Q.7 Which of the following involve ionic bonding only?
(a) Li3N (b) NaCl
(c) NCl3 (d) O2

Q.8 Which of the following involve covalent bonding only?
(a) KF (b) KCl
(c) CH4 (d) MgCl2

Q.9 Which of the following molecules has a net dipole moment?
(a) CO2 (b) CS2
(c) SO2 (d) CCl4

Q.10 H2S has a net dipole moment while BeF2 has zero dipole moment, because
(a) H2S molecule is linear while BeF2 is angular
(b) H2S molecule is angular, while BeF2 molecule is linear
(c) Fluorine has more electronegativity than S
(d) Be is more electronegative than S

Q.11 Which of the following ions has larger ionic radius?
(a) Na+ (b) K+
(c) Mg2+ (d) Al3+

Q.12 Which of the following bonds is least polar?
(a) H–Se (b) P–Cl
(c) H–Cl (d) N–Cl

Q.13 Which one has the least bond angle?
(a) NH3 (b) CH4
(c) H2O (d) BF3

Q.14 Coordinate covalent bonds are formed by
(a) sharing of electrons
(b) donation of electrons

(c) transference of electrons
(d) none of these

Q.15 Which of the following molecules would be expected to have zero dipole moment?

(a) H2S (b) PF3
(c) TeF6 (d) H2O

Q.16 The bond formed between the elements of low ionization energy and elements of high electron affinity is

(a) ionic (b) covalent
(c) metallic (d) coordinate

Q.17 The side ways overlap of two–p orbitals to form a bond is called

(a) sigma bond (b) pi (π) bond
(c) ionic bond (d) covalent bond

Q.18 The head overlap of p–orbitals of two atoms give rise to bond called

(a) sigma bond (b) pi (π) bond
(c) ionic bond (d) covalent bond

Q.19 Which element would be the most electronegative element with

(a) high ionization energy (IE) and low electron affinity (EA)
(b) low ionization energy (IE) and high electron affinity (EA)
(c) low ionization energy and low electron affinity
(d) high ionization energy and high electron affinity

Q.20 Which element would be the least electronegative element with

(a) high I.E. and low E.A. (b) low I.E. and high E.A.
(c) low I.E. and low E.A. (d) high I.E. and low E.A.

Q.21 Which of the following substances has the least ionic character in its bond?

(a) CCl4 (b) KCl
(c) BeCl2 (d) MgCl2

Q.22 Which of the following best describes ionization energy?

(a) energy needed to remove the most loosely bound electron from its ground state

(b) it decreases from left to right across a period

(c) it increases down the periodic table

(d) it is represented by $x + e^- \rightarrow x^- +$ energy

Q.23 Which one of the following characteristics is not usually attributed to ionic substances

(a) high melting point (b) deform when struck

(c) crystalline in solid state

(d) well defined three dimensional structure

Q.24 Which of the following bond is less polar?

(a) B–Cl (b) C–Cl

(c) H–I (d) C–I

Q.25 Which type of the orbital hybridization and geometry is used by the central atom of NH_2^-?

(a) sp2 hybridization and trigonal planar

(b) sp hybridization and tetrahedral geometry

(c) sp2 hybridization and trigonal planar

(d) sp3 hybridization and tetrahedral geometry

Q.26 Which of the following compounds has most likely been formed by covalent bonding of atoms

(a) CaF_2 (b) MgO

(c) SiH_4 (d) NaCl

Q.27 Identify the compound below which has bonds formed by an overlap of sp and p–orbitals

(a) BF_3 (b) $BeCl_2$

(c) NH_3 (d) H_2O

Q.28 The most electronegative of these group I element is

(a) Na (b) K

(c) Li (d) Cs

Q.29 The type of bonding in HBr is

(a) ionic (b) polar covalent

(c) non–polar covalent (d) coordinate covalent

Q.30 Which of the following statement is not correct
(a) sigma bond is weaker than a pi bond
(b) sigma bond is stronger than a pi bond
(c) double bond is stronger than a single bond
(d) double bond is shorter than a single bond

Q.31 Which of the following molecules has a pyramidal structure?
(a) CH4 (b) NH3
(c) H2O (d) C2H4

Q.32 The bond angle in water is
(a) 109–5o (b) 104.5o
(c) 107.0o (d) 120o

Q.33 During the formation of chemical bond, the potential energy of the system
(a) decreases (b) increases
(c) does not change (d) none of these

Q.34 H2O molecule has
(a) no lone pair (b) one lone pair
(c) two lone pairs (d) none of these

Q.35 NH3 molecule has
(a) no lone pair (b) one lone pair
(c) two lone pairs (d) three lone pairs

Q.36 In NH3 the covalent bond formed are due to
(a) s–sp overlap (b) s–sp2 overlap
(c) s–sp3 overlap (d) sp2–sp2 overlap

Q.37 Which of the following is largest atom
(a) Mg (b) Be
(c) Sr (d) Ca

Q.38 As compared to covalent compounds, ionic compounds generally have
(a) low melting points and low boiling points
(b) low melting points and high boiling points
(c) high melting points and high boiling points
(d) high melting points and low boiling points

Q.39 The attractive force that holds atoms together in a molecule is called

(a) force of attraction (b) electrostatic force
(c) bond (d) chemical bond

Q.40 Which of the following bonds will be formed between alkali metals and halogens

(a) ionic (b) covalent bond
(c) metallic bond (d) coordinate covalent bond

Q.41 The bond formed between the atoms by mutual sharing of electrons is

(a) ionic (b) coordinate covalent bond
(c) covalent (d) metallic

Q.42 A chemical bond formed between two similar atoms is purely

(a) ionic (b) covalent
(c) metallic (d) coordinate

Q.43 On the basis of VSEPR model the geometry of BeCl2 is

(a) linear (b) trigonal
(c) tetrahedral (d) angular

Q.44 On the basis of VSEPR theory, a molecule with three bond pair and no lone pair of electrons will have a structure

(a) linear (b) trigonal planar
(c) tetrahedral (d) trigonal pyramidal

Q.45 The geometry of NH3 on the basis of VSEPR model is

(a) trigonal planar (b) trigonal pyramidal
(c) tetrahedral (d) linear

Q.46 In which of the following theories the hybridization is considered

(a) VSEPR (b) Lewis
(c) molecular orbital (d) valence bond

Q.47 The angle between 3 sp2 hybrid orbital is

(a) 90o (b) 120o
(c) 130o (d) 180o

Q.48 The unhybridized “p” orbital in sp2 hybridization is

(a) parallel to sp2 (b) in the same plane

(c) perpendicular to sp2 orbitals
(d) out of plane

Q.49 Which of the following theories gives the idea of delocalization of electrons

(a) Lewis theory (b) VSEPR theory
(c) valence bond theory (d) molecular orbital theory

Q.50 The tandency of an atom to attract, a shared electron pair towards itself is called

(a) electron affinity (b) electronegativity
(c) dipole moment (d) ionization potential

Q.51 Energy needed to remove an electron from its gaseous atom is called

(a) electron affinity (b) ionization energy
(c) lattice energy (d) electronegativity

Q.52 A bond having partial positive and negative charges is

(a) ionic (b) covalent
(c) polar covalent (d) non–polar covalent

Q.53 A bond formed by the linear overlap of atomic orbitals is called

(a) sigma (b) ionic
(c) pi (d) polar

Q.54 Which of the following elements is the most electronegative

(a) Li (b) F
(c) O (d) Cl

Q.55 Some covalent compounds dissolve in water due to

(a) hydrolysis (b) hydration
(c) hydrogen bonding (d) metallic bonding

Q.56 Which of the following compounds will have the lowest boiling point?

(a) PH3 (b) ASH3
(c) NH3 (d) SbH3

Q.57 Which of the following molecules has a coordinate bond?

(a) NH4Cl (b) NaCl
(c) HCl (d) AlCl3

Q.58 The half of the difference between the number of electrons in bonding MO and antibonding MO is called

(a) molecule order (b) bond order
(c) proton order (d) electron order

Q.59 The bond order for He2 molecule is

(a) zero (b)
(c) 1 (d) 2

Q.60 The bond order for H2 is

(a) zero (b)
(c) 1 (d) 1.5

Q.61 The bond order in N2 molecule is

(a) zero (b) 1
(c) 2 (d) 3

Q.62 The bond order in O2 molecule is

(a) 1 (b) 2
(c) 3 (d) zero

Q.63 Which one of the following is diamagnetic

(a) B2 (b) C2
(c) N2 (d) O2–

Q.64 Which one of the following molecule is paramagnetic

(a) B2 (b) C2
(c) N2 (d) F2

Q.65 Which of the following ions is diamagnetic

(a) O (b) O
(c) O (d) N

Q.66 Pi bond consists of two regions of electron cloud density

(a) along the bond axis
(b) along and perpendicular to bond axis
(c) above and below the bond axis
(d) none of these

Q.67 Sigma bond consists of one region of electron density

(a) along the bond axis
(b) along and perpendicular to bond axis

(c) above and below the bond axis
(d) none of these

Q.68 The electron cloud density is symmetrical along the bond axis in
(a) sigma bond (b) pi bond
(c) both sigma and pi bond
(d) neither sigma nor pi bond

Q.69 The electron cloud density is not symmetrical along the bond axis in
(a) sigma bond (b) pi bond
(c) both sigma and pi bond
(d) neither sigma nor pi bond

Q.70 Covalent bonds are
(a) rigid and directional
(b) rigid and non–directional
(c) neither rigid nor directional
(d) non–rigid and directional

Q.71 Ionic bonds are
(a) rigid and directional
(b) rigid and non–directional
(c) non rigid non directional
(d) non–rigid and directional

Q.72 Which of the following statements is correct regarding the covalent compounds
(a) covalent compounds do not exhibit isomerism
(b) covalent compounds exhibit isomerism
(c) covalent compounds are soluble in water
(d) covalent compounds are insoluble in non–polar solvents

Q.73 The C–C bond length in ethane (C_2H_6) is
(a) 154 pm (b) 133 pm
(c) 120 pm (d) 105 pm

Q.74 The C–C bond length in ethene (C_2H_4) is
(a) 154 pm (b) 133 pm
(c) 120 pm (d) 105 pm

Q.75 The C–C bond length in ethyne is

(a) 154 pm (b) 133 pm
(c) 120 pm (d) 105 pm

Q.76 The atomic radii of the elements have a general trend of fluctuating periodically throughout the
(a) group (b) period
(c) periodic table (d) series

Q.77 Which of the following atom has the shortest atomic radius
(a) N (b) F
(c) O (d) B

Q.78 The half of the single bond length between two atoms in a molecule is called
(a) ionic radius of an element
(b) covalent radius of an element
(c) both ionic and covalent
(d) none of these

Q.79 Octet rule is not followed in the formation of
(a) CH4 (b) NF3
(c) BCl3 (d) H2O

Q.80 Select the atom with the largest ionization energy in the following atoms
(a) N (b) P
(c) AS (d) Sb

Q.81 Select the largest atom in the following atoms
(a) O (b) S
(c) Se (d) Te

Q.82 Which of the following group of elements on the average has the highest ionization energies
(a) IA (b) IIIA
(c) IVA (d) VIIIA

Q.83 Molecular orbital theory has
(a) the superiority over the VB theory
(b) the inferiority over the VB theory
(c) neither superiority nor inferiority over VB theory

(d) none of these

Q.84 The bond between H–H is
(a) stronger than the bond between H–Cl
(b) weaker than the bond between H–Cl
(c) neither stronger nor weaker than the bond between H–Cl
(d) none of these

Q.85 In which of the following molecules, the value of bond order in maximum
(a) H2 (b) O2
(c) N2 (d) Cl2

Q.86 When the S–character of hybridized orbital decreases the bond angle
(a) decreases (b) increases
(c) does not change (d) becomes zero

Q.87 One of the causes of reactions is that the systems attains the energy state which is of
(a) higher in energy (b) lower in energy
(c) balanced in energy (d) equal in energy

Q.88 The increase in the bond energy of a covalent bond is due to
(a) electronegativity (b) ionization energy
(c) polarity (d) symmetry

Q.89 The polarity of a molecule is expressed by
(a) bond strength (b) dipole moment
(c) bond length (d) shape

Q.90 Dipole moment of H2O is
(a) 1.85 (b) 1.82
(c) 1.87 (d) 1.83

ANSWERS

Questions	1	2	3	4	5
Answers	b	b	b	d	a
Question	6	7	8	9	10

s					
Answers	a	a	c	c	b
Questions	11	12	13	14	15
Answers	b	d	c	b	c
Questions	16	17	18	19	20
Answers	a	b	a	d	c
Questions	21	22	23	24	25
Answers	a	a	b	d	d
Questions	26	27	28	29	30
Answers	c	b	c	b	b
Questions	31	32	33	34	35
Answers	b	b	a	c	b
Questions	36	37	38	39	40
Answers	c	b	c	d	a
Questions	41	42	43	44	45
Answers	c	b	a	b	b
Questions	46	47	48	49	50
Answers	d	b	d	d	b
Questions	51	52	53	54	55
Answers	b	b	a	b	c
Questions	56	57	58	59	60
Answers	c	a	b	a	b
Question	61	62	63	64	65

s					
Answers	d	b	d	a	c
Questions	66	67	68	69	70
Answers	c	a	a	b	a
Questions	71	72	73	74	75
Answers	c	d	b	b	c
Questions	76	77	78	79	80
Answers	c	b	b	c	a
Questions	81	82	83	84	85
Answers	d	d	a	b	c
Questions	86	87	88	89	90
Answers	a	b	c	b	a

CHAPTER 7

THERMOCHEMISTRY

MCQs

Q.1 Which of the following statements is contrary to the first law of thermodynamics?

(a) energy can neither be created nor destroyed

(b) one form of energy can be transferred into an equivalent amount of other kinds of energy

(c) in an adiabatic process, the work done is independent of its path

(d) continuous production of mechanical work with out equivalent amount of heat is possible

Q.2 The change in heat energy of a chemical reaction at constant temperature and pressure is called

(a) enthalpy change (b) bond energy

(c) heat of sublimation (d) internal energy change

Q.3 For the reaction $NaOH + HCl \rightarrow NaCl + H_2O$, the change in enthalpy is called as:

(a) heat of reaction (b) heat of formation

(c) heat of neutralization (d) heat of combustion

Q.4 Calorie is equivalent to

(a) 0.4184 J (b) 41.84 J

(c) 4.184 J (d) 418.4 J

Q.5 For a given process, the heat change at pressure (qp) and constant volume (qv) are related to each other as

(a) $qp = qv$ (b) $qp < qv$

(c) $qp > qv$ (d) qp =

Q.6 The net heat change in a chemical reaction is same whether. It is brought about in two or more different ways in one or several steps. It is known as

(a) Henry's law (b) Joule's principle

(c) Hess's law (d) Law of conservation of energy

Q.7 Enthalpy of neutralisation of all the strong acids and strong bases has the same value because

(a) neutralisation leads to the formation of salt and H2O

(b) strong acid and bases are ionic substances

(c) acids always give rise to H+ ions and bases always furnish OH– ions

(d) the net chemical change involve the combination of H+ and OH– ions to form water

Q.8 If an endothermic reaction is allowed to take place very rapidly in the air. The temperature of the surrounding air

(a) remains constant (b) increase

(c) decrease (d) remain unchanged

Q.9 In endothermic reactions, the heat content of the

(a) products is more than that of reactants

(b) reactants is more than that of products

(c) both (a) and (b)

Q.10 Hess's law is also called

(a) first law of thermodynamics

(b) second law of thermodynamics

(c) first law of thermochemistry

(d) second law of thermochemistry

Q.11 Pressure – volume work is

(a) P D v (b) F x d

(c) h Δ v (d) H + p v

Q.12 Kinetic energy of molecules is due to

(a) rotational energy (b) vibrational energy

(c) translational energy (d) all of these

Q.13 The condition for standard enthalpy change is

(a) 1 atm 30oC (b) 1 atm 0oC

(c) 1 atm 25oC (d) 760 atm 25oC

Q.14 The unit of enthalpy change is

(a) calorie (b) joule

(c) volt (d) coulomb

Q.15 The sum of all kinds of a system is ions or molecules of a system is

(a) vibrational energy (b) potential energy

(c) kinetic energy (d) internal energy

Q.16 An endothermic reaction is one is which

(a) enthalpy of reactants and products are same

(b) enthalpy of products is greater than reactant

(c) enthalpy of products is lesser than reactants

(d) heat is evolved from system

Q.17 Bomb calorimeter is used to determine

(a) enthalpy of solution

(b) enthalpy of atomization

(c) enthalpy of combustion

(d) enthalpy of neutralization

Q.18 Glass calorimeter is used to determine

(a) enthalpy of combustion

(b) enthalpy of reaction

(c) pressure–volume work

(d) none of above

Q.19 Born–Haber cycle is used to calculate

(a) enthalpy of combustion

(b) lattice energy of ionic camps

(c) both a and b

(d) none of above

Q.20 Born–Haber cycle is an application of

(a) first law of thermodynamics

(b) second law of thermodynamics
(c) first law of thermochemistry
(d) Hess's law

Q.21 An exothermic reaction is one in which
(a) enthalpy of reactants and products are same
(b) heat is absorbed by system
(c) enthalpy of products is greater than reactants
(d) enthalpy of reactants is lesser than products

Q.22 A substance under observation during an experiment
(a) surrounding (b) system
(c) state function (d) universe

Q.23 Enthalpy of neutralization is merely
(a) heat of solution (b) heat of atomization
(c) heat of combustion
(d) heat of formation of H2O

Q.24 Lattice energy of NaCl is
(a) + 500 kJ (b) – 344 kJ
(c) – 776 kJ (d) – 411 kJ

Q.25 Standard enthalpy of Al2O3 cannot be measured because
(a) it does not catch fire
(b) it reacts with CO2
(c) protective layer of oxide cover the surface
(d) none of above

Q.26 Ammonium chloride dissolve in water this process is
(a) endothermic process (b) exothermic process
(c) simple hydration (d) none of above

Q.27 First law of thermodynamics is represented as
(a) D E = q + R T (b) D E = q + D P
(c) Δ E = q + Δ P (d) Δ E = q + w

Q.28 Pumping of water uphill is
(a) spontaneous reaction (b) exothermic reaction
(c) non–spontaneous reaction
(d) endothermic

Q.29 In exothermic reaction D H is

(a) positive (b) negative

(c) zero (d) none of above

ANSWERS

Questions	1	2	3	4	5
Answers	D	a	c	c	C
Questions	6	7	8	9	10
Answers	c	d	c	c	D
Questions	11	12	13	14	15
Answers	a	d	c	a	d
Questions	16	17	18	19	20
Answers	b	c	b	b	d
Questions	21	22	23	24	25
Answers	c	b	d	c	c
Questions	26	27	28	29	
Answers	a	d	b	b	

CHAPTER 8

CHEMICAL EQUILIBRIUM

MCQs

Q.1 A reaction is reversible because
(a) reactants are reactive (b) products are reactive
(c) products are stable (d) reactants are stable

Q.2 A large value of Kc means that at equilibrium
(a) less reactants and more products
(b) more reactants and less product
(c) same amount
(d) none

Q.3 Extent to $H2 + I2 \rightarrow 2HI$ can be increased by
(a) increasing pressure (b) increasing product
(c) increasing temp (d) adding a catalyst

Q.4 Strength of an acid can be determined by
(a) PKa (b) PKp
(c) POH (d) PKw

Q.5 In an exothermic reversible reaction increase in temp shifts the equilibrium to
(a) reactant side (b) product side
(c) remains unchanged (d) none

Q.6 Units of Kw are
(a) mole dm–3 (b) mole2 dm–3
(c) mole2 dm–6 (d) mole2 dm–3

Q.7 A basic Buffer solution can be prepared by mixing
(a) weak acid and its salt with strong base
(b) strong acid and its salt with weak base
(c) weak base and its salt with strong acid
(d) strong base and its salt with weak acid

Q.8 Buffer action can be explained by
(a) common ion effect (b) law of mass action

(c) Le–Chatlier's principle (d) all above

Q.9 Ionization of weak acid is expressed in term of following constant

(a) Kw (b) Kn

(c) Ka (d) Kb

Q.10 Solubility of Ca(OH)2 is exothermic. If solubility will increase

(a) at high temp (b) at low temp

(c) temp independent (d) none

Q.11 For which system does the equilibrium constant, Kc has units of concentration

(a) N2 + 3H2 2NH3 (b) H2 + I2 2 HI

(c) 2NO2 N2O4 (d) 2HF H2 + F2

Q.12 Which statement about the following equilibrium is correct

2SO2(g) + O2(g) 2SO3(g) $\Delta H = -188.3$ kJ mol–1

(a) the value of Kp falls with a rise in temp

(b) the value of Kp falls with increasing pressure

(c) adding V2O5 catalyst increase the equilibrium yield of sulphur trioxide

(d) the value of Kp is equal to Kc

Q.13 The PH of 10–3 mole dm–3 of an aqueous solution of H2SO4 is

(a) 3.0 (b) 2.7

(c) 2.0 (d) 1.5

Q.14 The solubility product of AgCl is 2.0 x 10–10 mole2 dm–6. The max concentration of Ag+ ions in the solution is

(a) 2.0 x 10–10 mol dm–3 (b) 1.41 x 10–5 mol dm–3

(c) 1.0 x 10–10 mol dm–3 (d) 4.0 x 10–20 mol dm–3

Q.15 An excess of aqueous silver nitrate to added to aqueous barium chloride and precipitate is removed by filtration what are the main ions in the filtrate

(a) Ag+ and NO only (b) Ag+ and Ba2+ and NO3

(c) Ba2+ and NO only (d) Ba+2 and NO and Cl–

Q.16 For N2 + 3H2 2NH3

(a) Kc = Kp (b) Kp = Kc RT

(c) Kp = Kc (RT)–2 (d) Kp = Kc (RT)–1

Q.17 H2 + I2 2HI

In the above equilibrium system, if the conc. of reactants of 25oC is increased, the value of Kc will

(a) increase (b) decrease
(c) remains constant
(d) depends upon nature of reactants

Q.18 In a chemical reaction, equilibrium is said to have established when

(a) opposing reactions stops
(b) concentrations of reactants and products are equal
(c) rate constants of opposing reactions are equal

Q.19 The relation between Kc and Kp is

(a) Kc = Kp (RT) Δn (b) Kp = Kc (RT) Δn
(c) Kp = Kc (RT) Δn (d) Kp = Kc

Q.20 The precipitation occurs if the ionic concentration is

(a) less than Ksp (b) more than Ksp
(c) equal to Ksp (d) is present at any moment

Q.21 The PH of oranges is

(a) 3.5 (b) 3.1
(c) 4.6 (d) 4.2

Q.22 Which one of following solution have zero PH

(a) 1M HCl (b) 0.5 MH2SO4
(c) 0.1 M HNO3 (d) 1M CH3COOH

Q.23 The solubility product expression for BaF2 can be written as

(a) [Ba2+] [F–] (b) [Ba2+] [2F]
(c) [Ba2+] [F–]2 (d) [Ba+] [F–]2

Q.24 To prepare a buffer with PH close to 9.0, you could use a mixture of

(a) NH4OH and NH4Cl
(b) CH3COOH and CH3COONa
(c) HNO2 + NaNO2
(d) NaHCO3 + H2CO3

Q.25 For which reaction the numerical value of Kc and Kp are same

(a) $N_2 + 3H_2 \rightleftharpoons 2NH_3$ (b) $2SO_2 + O_2 \rightleftharpoons 2SO_3$

(c) $H_2 + Cl_2 \rightleftharpoons 2HCl$ (d) $N_2O_4 \rightleftharpoons 2NO_2$

Q.26 For which system does the equilibrium constant Kc have units (mole $dm^{-3})^{-1}$

(a) $H_2 + I_2 \rightleftharpoons 2HI$ (b) $N_2 + 3H_2 \rightleftharpoons 2NH_3$

(c) $2NO_2 \rightleftharpoons N_2O_4$

(d) $CH_3COOH + C_2H_5OH \rightleftharpoons CH_3COOC_2H_5 + H_2O$

Q.27 What can affect the magnitude of equilibrium constant Kp of a reversible gaseous reaction

(a) temperature (b) pressure

(c) catalyst (d) none of above

Q.28 Which gas can change the PH towards acidic

(a) argon (b) carbon dioxide

(c) nitrogen (d) oxygen

Q.29 The solution having zero PH will be

(a) basic (b) high basic

(c) neutral (d) highly acidic

Q.30 A solution have H^+ ions concentration 1×10^{-7} its PH will be

(a) acid (b) basic

(c) neutral (d) zero

Q.31 Which one of the following has highest PH

(a) 0.1 M HCl (b) 1.0 M HCl

(c) gastric juice (d) lemons

Q.32 Which PH is considered as basic

(a) 1 (b) 7

(c) 2 (d) 11

Q.33 The sum of PH and POH is

(a) 2 (b) 7

(c) 14 (d) 13.5

Q.34 A buffer solution can be prepared by mixing

(a) a strong acid and weak base

(b) a weak acid and weak base
(c) a strong acid and its salt
(d) a weak base and its salt with strong acid

Q.35 Law of mass action was presented by
(a) Henderson (b) Lewis
(c) Guldberg and Waage (d) Arrehenius

Q.36 The unit of Kc for reaction
$N_2 + O_2 \rightleftharpoons 2NO$
(a) mol dm–3 (b) mol–1 dm3
(c) mol–2 dm6 (d) no units

Q.37 PH of pure water is
(a) 3.2 (b) 4.2
(c) 7.0 (d) 0

Q.38 Which of following change will favour the formation of more SO_3 at equilibrium
$2SO_2 + O_2 \rightleftharpoons 2SO_3 + heat$
(a) by adding SO_3 at equilibrium
(b) by increasing temp
(c) by decreasing temp
(d) by decreasing pressure

Q.39 When pressure is applied to the given equilibrium
ice $\rightleftharpoons$ water which of the following will happen
(a) more ice will be formed
(b) more water will be formed
(c) equilibrium will not be disturbed
(d) water will formed

Q.40 Which of following change will favour the formation of more HI in the given reaction
$H_2 + I_2 \rightleftharpoons 2HI$
(a) increasing pressure
(b) decreasing pressure
(c) by adding more HI

(d) by adding more H2 and I2

ANSWERS

Questions	1	2	3	4	5
Answers	b	a	c	a	A
Questions	6	7	8	9	10
Answers	a	a	d	c	b
Questions	11	12	13	14	15
Answers	a	a	b	b	c
Questions	16	17	18	19	20
Answers	c	a	c	b	b
Questions	21	22	23	24	25
Answers	a	a	c	a	c
Questions	26	27	28	29	30
Answers	b	b	b	d	c
Questions	31	32	33	34	35
Answers	d	d	c	d	c
Questions	36	37	38	39	40
Answers	d	c	c	d	d

CHAPTER 9

SOLUTIONS

MCQs

Q.1 Which of the following solutions has the highest boiling point?

(a) 5.85% solution of NaCl
(b) 18.0% solution of glucose
(c) 6.0% solution of urea
(d) all have same boiling point

Q.2 Two solutions of NaCl and KCl are prepared separately by dissolving same amount of the solute in water. Which of the following statements is true for these solutions

(a) KCl solution will have higher boiling point than NaCl solution
(b) both the solutions have same boiling point
(c) KCl and NaCl solutions possess same vapour pressure

Q.3 Molarity of pure water is

(a) 1 (b) 18
(c) 55.5 (d) 6

Q.4 18 gm glucose is dissolved in 90 gm of water. The relative lowering of vapour pressure is equal to

(a) (b) 5.1
(c) (d) 6

Q.5 The molar boiling point constant is the ratio of the elevation in boiling point to

(a) molarity (b) molality
(c) mole fraction of solvent (d) less than that of water

Q.6 An aqueous solution of methanol in water has vapour pressure

(a) equal to that of water (b) equation to that of methanol
(c) more than that of water (d) less than that of water

Q.7 An ozeotropic mixture of two liquids boils at a lower temperature than either of them when

(a) it is saturated
(b) it shows positive deviation from Raoult's law
(c) it shows negative deviation from Raoult's law
(d) it is metastable

Q.8 In azeotropic mixture showing positive deviation from Raoult's law, the volume of mixture is

(a) slightly more than the total volume of components
(b) slightly less than the total volume of the component
(c) equal to the total volume of the components
(d) none of these

Q.9 A solution of glucose is 10%. The volume in which 1 gm mole of it is dissolved will be

(a) 1 dm3 (b) 1.8 dm3
(c) 200 cm3 (d) 900 cm3

Q.10 Colligative properties are the properties of

(a) dilute solutions which behave as nearly ideal solutions
(b) concentrated solutions which behave as nearly non–ideal solutions
(c) both (i) and (ii) (d) neither (i) nor (ii)

Q.11 The freezing mixture used in ice cream machine consists of ice and

(a) NaCl (b) CaCl2
(c) KNO3 (d) both a & c

Q.12 1 kg of sea water contains 4.96 x 10–3 gm of dissolved oxygen. The concentration of oxygen in sea water in ppm is

(a) 4.96 x 10–2 (b) 0.496
(c) 4.96 (d) 49.6

Q.13 A solution of sucrose is 34.2%. The volume of solution containing one mole of solute

(a) 500 cm3 (b) 1000 cm3
(c) 342 cm3 (d) 3420 cm3

Q.14 Salt of a weak acid with strong base when dissolved in water gives

(a) acidic solution (b) basic solution
(c) neutral solution (d) none

Q.15 Mole fraction of 10% urea is

(a) 0.042 (b) 0.023
(c) 0.032 (d) 0.072

Q.16 Which of the following mixtures of liquids show negative deviation

(a) ethyl alcohol ether (b) HCl and water
(c) phenol – water
(d) chlorobenzene – bromobenzene

Q.17 The term cryoscopy is used

(a) depression of freezing point
(b) elevation in boiling point
(c) lowering of vapour pressure
(d) osmotic pressure

Q.18 The term ebullioscopy is used

(a) depression of freezing point
(b) elevation in boiling point
(c) lower of vapour pressure
(d) none of above

Q.19 Azeotropic mixture

(a) obey Henry's law
(b) obey Raoult's law
(c) do not obey Raoult's law
(d) obey Dalton's law

Q.20 Hydrolysis of potassium acetate produce

(a) acidic solution (b) neutral solution
(c) basic solution (d) none of these

Q.21 Which one of the following salts will not hydrolyse

(a) NaCl (b) AlCl3

(c) Na2CO3 (d) CH3COONa

Q.22 The sum of mole fractions (X) of components of a solution is equal to

(a) 100 (b) 200
(c) one (d) zero

Q.23 Which pair of mixture is called idea solution

(a) nicotine–water
(b) chlorobenzene & bromobenzene
(c) water–ether
(d) water–alcohol

Q.24 The vapour pressure of aqueous solution of sugar solution is

(a) equal to vapour pressure of water
(b) more than vapour pressure of pure water
(c) less than vapour pressure of pure water
(d) none of above

Q.25 When NaCl is dissolved in water

(a) melting point decrease
(b) boiling point decrease
(c) both melting and boiling point decrease
(d) none of above

Q.26 The solution which distils without change in composition is called

(a) unsaturated solution (b) saturated solution
(c) zeotropic mixture (d) azeotropic mixture

Q.27 Solubility curve of Na2SO4 10 . H2O shows

(a) constant increase of solubility
(b) constant decrease of solubility
(c) discontinuous solubility with temp
(d) none of above

Q.28 Use of glycol as antifreeze in the automobile is an important application of

(a) colligative property
(b) Roault's law

(c) fractional crystallization
(d) hydrolysis

Q.29 Use of NaCl in ice cream making is an important application of
(a) constitutive property
(b) additive property
(c) colligative property
(d) Roault's law

Q.30 Which one of the following solutions will have higher vapour pressure than that of water
(a) aqueous solution of CH3OH
(b) aqueous solution of H2SO4
(c) aqueous solution of sugar
(d) aqueous solution of urea

Q.31 Ethylene glycol is mixed with water as anti freeze in radiator because
(a) it has low vapour pressure
(b) it raises the boiling point of water
(c) it lowers the freezing point of water
(d) it changes osmotic pressure
(e) it has all characters

Q.32 Which one of following is not soluble in alcohol
(a) KCl (b) urea
(c) acetone (d) ether

Q.33 Mixture of alcohol and water can be separated by
(a) solvent extraction (b) crystallization
(c) filtration (d) fractional distillation

Q.34 Which one of following is not a conjugate solution
(a) ether + water (b) phenol + water
(c) nicotine + water (d) ethanol + water

Q.35 Which one of the following has discontinuous solubility curve
(a) NaCl (b) KCl
(c) NaNO3 (d) CaCl2 . 6H2O

Q.36 Which one of following has continuous solubility curve

(a) NaCl (b) NaNO3
(c) Na2SO4 . 10H2O (d) both a and b

Q.37 Solubility of following decrease with increase in temp
(a) Ce2(SO4)3 (b) CaCl2 . 6H2O
(c) Pb(NO3)2 (d) K2Cr2O7

Q.38 According to Roault's law
(a) relative lowering of V.P. is equal to mole fraction of solute
(b) the lowering of V.P. is directly proportional to the mole fraction of solute
(c) V.P. of a solvent above a solution is equal to product of V.P. of pure solvent and mole fraction of solvent in solution
(d) all the above

Q.39 The solution of KCl
(a) acidic (b) basic
(c) neutral (d) none of above

Q.40 Na2SO4 solution is
(a) acidic (b) basic
(c) neutral (d) none of above

Q.41 The solution of CuSO4 is
(a) acidic (b) basic
(c) neutral (d) none of above

Q.42 The solution of AlCl3 is
(a) acidic (b) basic
(c) neutral (d) none of above

Q.43 The solution of CH3COONa
(a) acidic (b) basic
(c) neutral (d) none of above

Q.44 The no. of water of crystallization of MgCl2
(a) 12 (b) 6
(c) 3 (d) 4

Q.45 The no. of water of crystallization of MgSO4

(a) 12 (b) 7
(c) 5 (d) 3

Q.46 Freezing point depression is measured by
(a) Beckmann's apparatus
(b) Land's Berger's
(c) Antifreeze apparatus
(d) all the above

Q.47 Elevation of boiling is measured by
(a) Beckmann's apparatus
(b) Lands berger's method
(c) Antifreeze apparatus
(d) none of above

Q.48 Colligative properties are the properties of solution that depends upon
(a) nature of molecules (b) quality
(c) physical property (d) no. of molecules

Q.49 Aqueous solution of glucose boils at 100.52oC. The solution contains
(a) 180 gm glucose in 1 litre water
(b) 90 gm glucose in 1 litre water
(c) 18 gm glucose in 1 litre water
(d) 3.6 gm glucose in 1 litre water

Q.50 Aqueous solution of methanol is zeotropic mixture because
(a) it does not obey the Roalt's law
(b) mixture cannot be separated by sublimate
(c) mixture can be separated by distillation
(d) greater volume than the volume of component

Q.51 When equal volumes of ether and water are shaken, then two layers are formed the ether layer contains water
(a) 5.3% (b) 6.3%
(c) 1.2% (d) 2.1%

ANSWERS

Questions	1	2	3	4	5
Answers	d	b	c	c	B
Questions	6	7	8	9	10
Answers	c	b	a	b	a
Questions	11	12	13	14	15
Answers	d	c	b	b	c
Questions	16	17	18	19	20
Answers	b	a	b	c	c
Questions	21	22	23	24	25
Answers	a	c	b	e	a
Questions	26	27	28	29	30
Answers	d	c	a	c	d
Questions	31	32	33	34	35
Answers	e	a	d	d	d
Question	36	37	38	39	40

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Answers	d	a	d	c	c
Questions	41	42	43	44	45
Answers	a	a	b	b	b
Questions	46	47	48	49	50
Answers	a	b	d	a	c
Questions	51				
Answers	c				

CHAPTER 10

ELECTROCHEMISTRY

MCQS

Q.1 Electrolysis is the process in which a chemical reaction takes place at the expense of

(a) chemical energy (b) electrical energy

(c) heat energy (d) none of these

Q.2 Standard hydrogen electrode has an arbitrarily fixed potential

(a) 0.00 volt (b) 1.00 volt

(c) 0.10 volt (d) none of these

Q.3 The oxidation number of chromium in K2Cr2O7 is

(a) 14 (b) 12

(c) 6 (d) none of these

Q.4 In the reaction 2 Fe + Cl2 (2FeCl3

(a) Fe is reduced (b) Fe is oxidized

(c) Cl2 is oxidized (d) none of these

Q.5 When fused PbBr2 is electrolyzed

(a) bromine appears at cathode

(b) lead is deposited at the cathode

(c) lead appears at the anode

(d) none of these happens

Q.6 When aqueous solution of NaCl is electrolysed

(a) Cl2 is evolved at the cathode

(b) H2 is evolved at cathode

(c) Na is deposited at the cathode

(d) Na appears at the anode

Q.7 During electrolysis of KNO3, H2 is evolved at

(a) anode (b) cathode
(c) both (a) and (b) (d) none of these

Q.8 During electrolysis of CuSO4 (aq) using Cu electrodes Cu is deposited at
(a) anode (b) cathode
(c) both (a) and (b) (d) none of these

Q.9 During electrolysis of fused NaCl, which of the following reaction occurs at anode
(a) Cl– ions oxidized (b) Cl– ions reduced
(c) Na+ ions oxidized (d) Na+ ions reduced

Q.10 An electrochemical cell is based upon
(a) acid–base reaction (b) redox reaction
(c) nuclear reaction (d) none of the above

Q.11 Which one of the following will be good conductor of electricity
(a) pure distilled water (b) molten NaCl
(c) dilute solution of glucose
(d) chloroform

Q.12 Which one of the following represents the same net reaction as the electrolysis of aqueous H2SO4
(a) electrolysis of water
(b) electrolysis of molten NaCl
(c) electrolysis of aqueous HCl
(d) electrolysis of aqueous NaCl

Q.13 In a galvanic cell, the reaction occurs
2H2O (O2 (g) + 4H+ + 4e– It occurs at the
(a) cathode (b) anode
(c) cathode and anode (d) none of the above

Q.14 Which statement below is not true for the reaction
Fe3+ + e– (Fe2+

(a) Fe3+ is reduced
(b) oxidation state of Fe has changed
(c) Fe3+ can act as an oxidizing agent
(d) both Fe2+ and Fe3+ are called anions

Q.15 During a redox reaction, an oxidizing agent
(a) gains electrons (b) is oxidized
(c) loses electrons (d) is hydrolysed

Q.16 In a salt bridge KCl is used because
(a) it is an electrolyte
(b) K+ and Cl– transfer easily
(c) agar–agar forms a good jelly with it
(d) KCl is also present in the calomel electrode

Q.17 A oxidizing agent is a substance which brings about
(a) electron donation (b) oxidation
(c) reduction (d) hydrolysis

Q.18 In the electrolysis the process of oxidation occurs at
(a) anode (b) cathode
(c) both cathode and anode
(d) in electrolytic solution

Q.19 In an oxidation process the oxidation number of the element
(a) increases (b) decreases
(c) does not change (d)

Q.20 In the reduction process the oxidation number of the element
(a) increases (b) decreases
(c) does not change (d)

Q.21 Oxidation number of oxygen in OF2 is
(a) + 1 (b) – 1
(c) + 2 (d) – 2

Q.22 The e.m.f. of Zn – Cu cell is

(a) 1.10 v (b) 1.5 v
(c) 2.0 v (d) 2.5 v

Q.23 The standard reduction potential of a standard hydrogen electrode
(a) 0.0 v (b) 1.1 v
(c) 1.5 v (d) 2.0 v

Q.24 The oxidation number of Mn is K2 MnO4 is
(a) + 2 (b) + 4
(c) + 6 (d) + 7

Q.25 Which of the following is the definition of oxidation
(a) gain of electrons (b) loss of electrons
(c) addition of H2 (d) removal of O2

Q.26 During electrolysis of H2SO4 (aq) O2 is evolved at
(a) cathode (b) anode
(c) both a and b (d) none of these

Q.27 The e.m.f. produced by a voltage cell is
(a) electrode potential (b) reduction potential
(c) cell potential (d) oxidation potential

Q.28 Which of the following is not a redox reaction
(a) CaCO3 (CaO + CO2
(b) Cu + 4HNO3 (Cu(NO3)2 + 2NO2 + H2O
(c) 2H2 + O2 (2H2O
(d) MnO2 + 4HCl (MnCl2 + Cl2 + 2H2O

Q.29 Which element acts as a reducing agent in the reaction
Zn + H2SO4 (ZnSO4 + H2
(a) Zn (b) H
(c) S (d) O

Q.30 Which element acts as a oxidizing agent in the reaction
MnO2 + 4HCl (MnCl2 + Cl2 + 2H2O

(a) Mn (b) O
(c) H (d) Cl

Q.31 When the current is passed through an electrolytic solution, which of the following process will occur
(a) anions move towards anode and cations move towards cathode
(b) cations and anions both move towards anode
(c) cations and anions both move towards anode
(d) no movement of the ions occur

Q.32 Electric current passes through both molten and solution form of NaCl because of
(a) ionic bonding (b) Na+ and Cl– ions
(c) ions of water (d) hydration of ions

Q.33 A cell which produces electric current by redox reaction is called
(a) standard cell (b) voltaic cell
(c) reversible cell (d) concentration cell

Q.34 Which of the following conduct electricity due to the migration of electrons only
(a) copper metal (b) NaCl molten
(c) NaCl (d) NaCl solution

Q.35 Oxidation number of sulphur in S2O eq \a\co1(2–,3) is
(a) + 6 (b) – 2
(c) + 2 (d) + 4

Q.36 Substances through which electric current can pass are called
(a) insulators (b) conductors
(c) cathode (d) anode

Q.37 Substances through which electric current cannot pass are called
(a) insulators (b) conductors
(c) anode (d) cathode

Q.38 Metallic conduction is due to the

(a) movement of electrons
(b) movement of ions
(c) both (a) and (b)
(d) none of these

Q.39 Metallic conductors conduct electricity
(a) with chemical change
(b) without any chemical change
(c) both (a) and (b)
(d) none of these

Q.40 The flow of electrons is called
(a) electrolyte (b) electric current
(c) cathode (d) anode

Q.41 A substance which in molten state or in solution form allows electric current to pass through it is called
(a) electrolyte (b) insulator
(c) conduction (d) none of these

Q.42 The process in which electric current is used to carry out a non–spontaneous redox reaction is called
(a) electrolyte (b) electrolysis
(c) metallic conductor (d) electrodes

Q.43 In electrochemical cells, the electrode at which the reduction occurs is called
(a) anode (b) cathode
(c) electrolyte (d) electrolysis

Q.44 The process of producing a chemical change in an electrolytic cell is called
(a) electrolyte (b) electrolysis
(c) electrodes (d) conductor

Q.45 The process in which ionic compound when fused or dissolved

in water split up into charged particles is called
(a) electrolysis (b) hydration
(c) ionization (d) conduction

Q.46 An apparatus in which chemical energy in converted to electrical energy is called
(a) electrolytic cell (b) galvanic cell
(c) fuel cell (d) down cell

Q.47 The metallic conductors in contact with the solution are called
(a) insulator (b) electrodes
(c) electrolyte (d) down cell

Q.48 The reaction in a galvanic cell is
(a) spontaneous (b) non–spontaneous
(c) acid–base (d) none of these

Q.49 Caustic soda is obtained by electrolysis of conc. aqueous solution of NaCl in a cell called
(a) Daniell's cell (b) Nelson's cell
(c) Down's cell (d) Voltaic cell

Q.50 Sodium metal is obtained by the electrolysis of fused NaCl in a cell is called
(a) Nelson's cell (b) Down's cell
(c) Daniell cell (d) Voltaic cell

Q.51 The e.m.f. of Daniell cell can be increased by
(a) increasing the area of electrode
(b) increasing the concentration of oxidising ion in the solution
(c) increasing the concentration of reducing ion in the solution
(d) adding the dil H_2SO_4

Q.52 Metal and their ionic salts both conduct electricity. Which of the following statement is not correct both
(a) are good conductors normally

(b) are ionic in nature
(c) decompose on passing current
(d) are normally solid

Q.53 The branch of chemistry which deals with the relationships between electricity and chemical reaction is called
(a) chemical kinetics (b) electrochemistry
(c) stiochiometry (d) thermochemistry

Q.54 A system containing of electrodes that dips into an electrolyte in which a chemical reaction either uses or generates an electric current is called
(a) voltaic cell (b) electrochemical cell
(c) voltaic or galvanic cell (d) fuel cell

Q.55 A cell in which spontaneous redox reaction generates an electric current is called
(a) electrolytic cell
(b) electrochemical cell
(c) voltaic orgalvanic cell
(d) biological cell

Q.56 A cell in which an electric current drives a non–spontaneous reaction is called
(a) electrolytic cell (b) voltaic cell
(c) biological cell (d) electrochemical cell

Q.57 A process for converting one metal with a thin layer of another metal is called
(a) electrolysis (b) electroplating
(c) electrode potential (d) standard electrode

Q.58 In an electrical connection between cathode and anode of a voltaic cell, electrons flow from the
(a) anode to the cathode (b) cathode to the anode

(c) both (a) and (b) (d) none of these

Q.59 Greater the value of standard reduction potential of a species indicates

(a) greater its tendency to accepted electrons

(b) lesser tendency to accept electrons

(c) greater tendency to lose electrons

(d) none of these

Q.60 In lead accumulator the electrolyte H_2SO_4 solution is

(a) 30 % (b) 60% H_2SO_4

(c) 80% (d) 90%

Q.61 In alkaline battery, the electrolyte contains

(a) MnO_2 (b) KOH

(c) NaCl (d) $NaNO_3$

Q.62 Alkali metals have

(a) lower value of reduction potential than coinage metals

(b) higher value of reduction potential than coinage metals

(c) equal values of reduction potential to coinage metals

(d) none of these

Q.63 Strong reducing agents have

(a) greater positive value of standard reduction potential

(b) greater negative value of standard reduction potential

(c) lesser positive value of standard reduction potential

(d) none of these

Q.64 Strong oxidizing agents have

(a) greater positive value of standard reduction potential

(b) lesser positive value of standard reduction potential

(c) greater negative value of standard reduction potential

(d) none of these

Q.65 The electrode with more negative value of reduction potential acts as

(a) cathode (b) anode

(c) electrode (d) none of these

Q.66 Metals which are above SHE in electrochemical series

(a) can liberate H2 from acid

(b) cannot liberate H2 from acid

(c) cannot always liberate H2 from acid

(c) none of these

Q.67 Corrosion reactions are

(a) spontaneous redox reactions

(b) non–spontaneous redox reactions

(c) spontaneous acid–base reactions

(d) none of these

Q.68 Voltaic cell can be changed into

(a) electrochemical cell (b) electrolytic cell

(c) reversible cell (d) primary cell

Q.69 Strongest oxidizing agent in the electrochemical series is

(a) Li (b) F

(c) H2 (d) I2

Q.70 Strongest reducing agent in the electrochemical series is

(a) Li (b) F

(c) H2 (d) I2

Q.71 Fuel cells are the means by which chemical energy may be converted into

(a) heat energy (b) electrical energy

(c) mechanical energy (d) sound energy

ANSWERS

Questions 1 2 3 4 5 Answers b a c b b Questions 6 7 8 9 10 Answers b b b a b Questions 11 12 13 14 15 Answers b a b d a Questions 16 17 18 19 20 Answers b c a a b Questions 21 22 23 24 25 Answers c a a c b Questions 26 27 28 29 30 Answers b c a a a Questions 31 32 33 34 35 Answers a b b a c Questions 36 37 38 39 40 Answers b a a b b Questions 41 42 43 44 45 Answers a b b b c Questions 46 47 48 49 50 Answers b b a b b Questions 51 52 53 54 55 Answers c b b b c Questions 56 57 58 59 60 Answers a b a a a Questions 61 62 63 64 65 Answers b a b a b Questions 66 67 68 69 70 Answers a a c b a Questions 71 Answers b

CHAPTER 11

REACTION KINETICS

MCQS

Q.1 In zero order reaction, the rate is independent of

(a) temperature of reaction
(b) concentration of reactants
(c) concentration of products
(d) none of above

Q.2 If the rate equation of a reaction 2A + B ® Product, Rate = k [A]2 [B] and A is present in large excess then order of reaction is:

(a) 1 (b) 2
(c) 3 (d) none of these

Q.3 The rate of reaction

(a) increases as the reaction proceeds
(b) decreases as the reaction proceeds
(c) remains the same as the reaction proceeds
(d) may decrease or increase as the reaction proceeds

Q.4 With increases of 10 oC temperature the rate of reaction doubles. This increase in the rate of reaction is due to

(a) decrease in activation energy of reaction
(b) decrease in the number of collisions b/w reactants molecules
(c) increase in activation energy of reactants
(d) increase in number of effective collisions

Q.5 The unit of the rate constant is the same as that of the rate of reaction in

(a) first order reaction (b) second order reaction
(c) zero order reaction (d) third order reaction

Q.6 The unit of reaction is
(a) mole/dm3 (b) mole/pound
(c) mole/dm3 sec (d) mole/cm3

Q.7 In the rate equation, when the conc. of reactants is unity then rate is equal to
(a) specific rate constant (b) average rate constant
(c) instantaneous rate constant
(d) none of above

Q.8 The rate of reaction between two specific time intervals is called
(a) instantaneous rate (b) average rate
(c) specific rate (d) ordinary rate

Q.9 Instantaneous rate of a chemical reaction is
(a) rate of reaction in the beginning
(b) rate of reaction at the end
(c) rate of reaction at a given instant
(d) rate of reaction b/w two specific time intervals

Q.10 At the beginning the decrease in the conc. of reactants is
(a) slow (b) moderate
(c) rapid (d) none of above

Q.11 The sum of exponents of the conc. terms in the rate equation is called
(a) rate of reaction (b) order of reaction
(c) specific rate constant (d) average rate

Q.12 The average rate and instantaneous rate of a reaction are equal
(a) at the start (b) at the end
(c) in the middle
(d) when two rate have time interval equal to zero

Q.13 The equation 2N2O5 ® 2N2 has order
(a) first order (b) second order
(c) negative order (d) fractional order

Q.14 The hydrolysis of tertiary butyl has order
(a) first order (b) pseudo first order
(c) fractional order (d) zero order

Q.15 Photochemical reactions usually have order

(a) one (b) zero

(c) two (d) three

Q.16 The experimental relationship between a reaction rate and the concentration of reactants is called

(a) order of reaction (b) specific rate

(c) law of mass action (d) rate law

Q.17 When the rate of reaction is entirely independent of the conc. of reactants molecule then order of reaction is

(a) zero (b) first

(c) second (d) third

Q.18 Half life of U is

(a) 7.1 x 108 years (b) 6.1 x 108 years

(c) 8.1 x 107 years (d) 7.1 x 1010 years

Q.19 Half life period for decomposition of N2O5 at 45 oC is

(a) 24 minutes (b) 34 minutes

(c) 44 minutes (d) 54 minutes

Q.20 The decomposition of ozone has order

(a) first (b) negative

(c) second (d) pseudo first order

Q.21 The equation CHCl3 + Cl2 ® CCl4 + HCl has order

(a) first (b) negative

(c) fractional (d) second

Q.22 When a reaction occurs in many steps then the slowest step is the

(a) main step

(b) enthalpy determining step

(c) mechanism determining step

(d) rate determining step

Q.23 Spectrometry applied for rate determination when

(a) reactants or product absorb U.V., I.R. light

(b) reaction involve ion

(c) reaction involve change in volume

(d) none of above

Q.24 Electrical conductivity method is applied for rate determination when

(a) reactants and products involve absorption of U.V. or I.R. radiation
(b) reaction involving ions
(c) reaction which involve change in refractive indices
(d) reactions which involve small volume change

Q.25 Dilatometric method is used for rate determination when

(a) reactions involving ions
(b) reactions involving change of optical activity
(c) reaction involving small volume change
(d) none of above

Q.26 Refractrometric method is used when

(a) reactions involving absorption of I.R. or U.V.
(b) reactions involving change of refractive index
(c) reactions involving ions
(d) change of optical activity

Q.27 Optical rotation method is used when
(a) reaction involve ions
(b) change of refractive indices
(c) reactions involving change of optical activity
(d) none of above

Q.28 The substance which retard the rate of chemical reaction
(a) catalyst (b) inhibitor
(c) auto catalyst (d) enzyme

Q.29 The enzyme used in the hydrolysis of urea is
(a) urease (b) amylase
(c) oxidase (d) reductase

Q.30 In the hydrolysis of CH3COO2H5 the acid produce act as
(a) inhibitor (b) catalyst
(c) auto catalyst (d) none of above

Q.31 The order of reaction can be determined by
(a) graphical method (b) method of hit and trial
(c) differential method (d) all of above

Q.32 The factors which affect rate of reaction
(a) nature of reactants (b) surface area
(c) light (d) all of above

Q.33 When temp of reacting gases is raised to 10 K, the reaction rate becomes
(a) remain same (b) double
(c) triple (d) increase four times

Q.34 Arrhenius equation describe the effect of
(a) temp on rate of reaction
(b) volume on rate of reaction
(c) pressure on rate of reaction
(d) all the above

Q.35 A substance which alters the rate of reaction
(a) inhibitor (b) catalyst
(c) promoter (d) auto catalyst

Q.36 Homogeneous catalysis when

(a) reactants and catalyst have same phase
(b) products and catalyst have same phase
(c) reactant and products have same phase
(d) none of above

Q.37 The heterogenous catalysis
(a) reactants and products have different phases
(b) reactants and catalyst have different phases
(c) products and catalyst have different phases
(d) all the above

Q.38 Tetra ethyl lead when added to petrol, acts as
(a) negative catalyst (b) auto catalyst
(c) promoter (d) catalyst

Q.39 Concentrated sugar solution undergoes hydrolysis by an enzyme
(a) invertase (b) urease
(c) zymase (d) glucase

Q.40 Glucose is converted into ethanol by an enzyme
(a) urease (b) invertase
(c) zymase (d) glucose

ANSWERS

Questions	1	2	3	4	5
Answers	b	a	b	d	c
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s					
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Answers	a	b	a	a	c