CHEMISTRY
GROUP : FIRST　　　　**OBJECTIVE** DGK-GI-22　　TIME: 20 MINUTES　MARKS: 17

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

1	The largest number of molecules are present in
	(A) 3.6 g of H_2O　(B) 4.8 g of C_2H_5OH　(C) 2.8 g of CO　(D) 5.4 g of N_2O
2	Many elements have fractional atomic masses. This is because
	(A) The mass of the atom is itself fractional　(B) Atomic masses are average masses of isobars
	(C) Atomic masses are average masses of isotopes
	(D) Atomic masses are average masses of isotopes proportional to their relative abundance
3	The comparative rates at which the solutes move in paper chromatography , depend on
	(A) The size of paper　(B) Rf values of solutes　(C) Temperature of the experiment
	(D) Size of the chromatographic tank used
4	The solvent commonly used in solvent extraction is
	(A) Methyl alcohol　(B) Diethyl ether　(C) Liquid ammonia　(D) Hydrochloric acid
5	How should the conditions be changed to prevent the volume of a given gas from expanding when its mass is increased ?
	(A)Temperature is lowered and pressure is increased (B) Temperature is increased and pressure is lowered
	(C) Temperature and pressure both are lowered　(D) Temperature and pressure both are increased
6	The order of the rate of diffusion of gases NH_3 , SO_2 , Cl_2 and CO_2 is
	(A) $NH_3 > SO_2 > Cl_2 > CO_2$　　(B) $NH_3 > CO_2 > SO_2 > Cl_2$　　(C) $Cl_2 > SO_2 > CO_2 > NH_3$
	(D) $NH_3 > CO_2 > Cl_2 > SO_2$
7	In order to raise the boiling point of water upto 110 °C , the external pressure should be
	(A) Between 760 torr and 1200 torr　(B) Between 200 torr and 760 torr
	(C) 765 torr　(D) Any value of pressure
8	Ionic solids are characterized by
	(A) Low melting points　(B) Good conductivity in solid state　(C) High vapour pressures
	(D) Solubility in polar solvents
9	When 6 d orbital is complete , the entering electron goes into
	(A) 7 f　(B) 7 s　(C) 7 p　(D) 7 d
10	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 not account for the stability of the atom
	(D) There is actually no space between the nucleus and the electrons
11	Which one has perfectly triangular shape ?
	(A) $SnCl_2$　(B) CO_2　(C) SO_3　(D) NH_3
12	Which of the hydrogen halides has the highest percentage of ionic character ?
	(A) HCl　(B) HBr　(C) HF　(D) HI
13	If an endothermic reaction is allowed to take place very rapidly in the air , the temperature of the surrounding air
	(A) Remains constant　(B) Increases　(C) Decreases　(D) Remains unchanged
14	An excess of aqueous silver nitrate is added to aqueous barium chloride and precipitate is removed by filtration. What are the main ions in the filtrate ?
	(A) Ag^+ and NO_3^- only　(B) Ag^+ , Ba^{2+} and NO_3^-　(C) Ba^{2+} and NO_3^- only　(D) Ba^{2+} , NO_3^- and Cl^-
15	18 g glucose is dissolved in 90 g of water. The relative lowering of vapour pressure is equal to
	(A) $\frac{1}{5}$　(B) 5.1　(C) $\frac{1}{51}$　(D) 6
16	If a strip of Cu metal is placed in a solution of $FeSO_4$
	(A) Cu will be deposited (B) Fe is precipitated out (C) Cu and Fe both dissolve (D)No reaction takes place
17	In the rate equation of a reaction $2A + B \rightarrow$ products is , 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

CHEMISTRY
GROUP : FIRST

SUBJECTIVE
SECTION-I

TIME : 2:40 HOURS
MARKS : 68

09k-91-22

QUESTION NO. 2 Write short answers of any **Eight (8)** parts of the following   16

i	Law of conservation of mass has to obeyed during stoichiometric calculations. Give reason
ii	Why elements have fractional atomic masses ?
iii	Why we use the term relative atomic mass ?
iv	Why regular air cannot be used by sea divers ?
v	Real Gas show non ideal behavior Why ?
vi	Give any two applications of plasma
vii	Define Rf value and why it has no unit ?
viii	Differentiate between stationary and mobile phase
ix	Give applications of paper chromatography
x	Draw out and Labelled the Bomb calorimeter
xi	Burning of candle is spontaneous process. Justify it
xii	Justify Hess's law with an example

QUESTION NO. 3 Write short answers of any **Eight (8)** parts of the following   16

i	Define hydrogen bonding
ii	Why evaporation causes cooling ?
iii	What is meant by anisotropy ?
iv	Differentiate between Allotropy and Polymorphism
v	State Hund's rule with example
vi	Why e/m value of cathode rays is equal to electron ?
vii	Differentiate between fast and slow neutrons
viii	Positive rays are also called canal rays why ?
ix	What are hydrates ? Give one example
x	Describe continuous solubility curve with graph and example
xi	What is negative catalysis. Give example
xii	Define half life period. What is its importance ?

QUESTION NO. 4 Write short answers of any **Six (6)** parts of the following   12

i	Differentiate between bonding molecular orbital and antibonding molecular orbital
ii	Why do the lone pairs of electrons occupy more space than the bond pairs ?
iii	The dipole moments of CH_4 and CO_2 are zero but that of H_2O is 1.85 D. Why ?
iv	The size of anion is larger than its parents neutral atom. Give the reason
v	Define standard enthalpy of neutralization. Give an example
vi	Differentiate between spontaneous and non-spontaneous process
vii	Why is it necessary to mention the physical states of the reactants and products in thermochemical equations ?
viii	How can copper be purified electrolytically ?
ix	Differentiate between electrolytic and voltaic cell

SECTION-II

Note: Attempt any Three questions from this section

Q.5 (A)	Define the following terms and give two examples of each (i) Gram Formula (ii) Gram ion (iii) Gram atom (iv) Percentage yield	$(½ + ½) × 4 = 4$
(B)	Explain Planck's quantum theory of radiations and derive the relation $E = h\,c\,\bar{v}$	4
Q.6 (A)	Calculate the density of $CH_{4\,(g)}$ at 0 °C and 1 atmospheric pressure , What will happen to the density if temperature is increased to 27 °C	2+2
(B)	Describe the construction and working of standard hydrogen electrode	2+2
Q.7 (A)	Draw the molecular orbital picture of O_2 molecule and also explain its paramagnetic nature	3+1
(B)	Define the following with suitable example (i) Enthalpy of Neutralization (ii) Enthalpy of formation	2+2
Q.8 (A)	Explain properties of ionic solids	4
(B)	What is the percentage ionization of acetic acid in a solution in which 0.1 mol of it has been dissolved per dm^3 of the solution	4
Q.9 (A)	Define hydrolysis. Explain it with two examples	1+3
(B)	Define enzyme. Mention three characteristics of enzyme catalysis	1+3

11th CLASS – 12022

CHEMISTRY   TIME: 20 MINUTES

GROUP : SECOND   **OBJECTIVE**   MARKS: 17

NOTE: You have four choices for each objective type question as A , B , C and D . The choice which you think is correct , fill that circle in front of that question number. Use marker or pen to fill the circles. Cutting or filling two or more circles will result in zero mark in that question.

QUESTION NO. 1

1	The mass of one mole of electrons is
	(A) 1.008 mg (B) 0.55 mg (C) 0.184 mg (D) 1.673 mg
2	Number of isotopes of calcium are
	(A) 02 (B) 03 (C) 05 (D) 06
3	Comparative rates at which the solute moves in paper chromatography depends upon
	(A) Size of paper (B) Rf value of solute (C) Temperature of experiment (D) Size of chromatographic tank
4	Rate of filtration can be increased by using
	(A) Suction flask (B) Desiccator (C) Glass funnel (D) Cold finger
5	Pressure remaining constant at which temperature the volume of the gas will become twice of what it is at $0\ ^oC$
	(A) $546\ ^oC$ (B) $200\ ^oC$ (C) 546 k (D) 273 k
6	The deviation of gas from ideal behavior 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
7	Acetone and chloroform are soluble to each other due to
	(A) Ion dipole interaction (B) Instantaneous dipole (C) Intermolecular hydrogen bonding
	(D) Debye forces
8	Amorphous solids
	(A) Have sharp melting point (B) Undergo clean cleavage when cut with knife
	(C) Have perfect arrangement of atoms (D) Can possesses small regions of orderly arrangement of atom
9	When 6 d orbital is complete , the entering electron goes into
	(A) 7 f (B) 7 s (C) 7 p (D) 7 d
10	Velocity of photon is
	(A) Independent of its wavelength (B) Depends on its wavelength (C) Equal to square of its amplitude
	(D) Depends upon its source
11	Which of the following hydrogen halide has the highest percentage of ionic character ?
	(A) HCl (B) HF (C) HBr (D) HI
12	In sp hybrid orbital percentage of S-character is
	(A) 100 % (B) 25 % (C) 75 % (D) 50 %
13	In endothermic reaction the heat content of the
	(A) Product is more than reactants (B) Reactants is more than products
	(C) Both have equal heat contents (D) Both a and b are correct
14	The solubility product of AgCl is $2.0 \times 10^{-10}\ mol^2\ dm^{-6}$. The maximum concentration of Ag^+ ions in solution is
	(A) $2.0 \times 10^{-10}\ mol\ dm^{-3}$ (B) $1.41 \times 10^{-5}\ mol\ dm^{-3}$ (C) $1.0 \times 10^{-10}\ mol\ dm^{-3}$ (D) $4.0 \times 10^{-20}\ mol\ dm^{-3}$
15	Molarity of pure water is
	(A) 01 (B) 18 (C) 55.5 (D) 6
16	The cathodic reaction in the electrolysis of dil H_2SO_4 with Pt. electrode is
	(A) Reduction (B) Oxidation (C) Both oxidation and reduction (D) Neither oxidation nor reduction
17	The unit of rate constant is the same as the rate of reaction in
	(A) First order reaction (B) Second order reaction (C) Third order reaction (D) Zero order reaction

CHEMISTRY | SUBJECTIVE | TIME : 2:40 HOURS
GROUP : SECOND | SECTION-I | MARKS : 68

DGK-S/2-22

QUESTION NO. 2 Write short answers of any Eight (8) parts of the following   16

i	23 g of sodium and 238 g of uranium have equal number of atoms in them. Give the reason
ii	Calculate the number of water molecules in 10 g of ice
iii	What is the principle of mass spectrometry ?
iv	Give the main uses of paper chromatography
v	Write down the four characteristics of the solvent used for crystallization
vi	Define sublimation with an example
vii	Gases deviate more significantly from ideal behaviour at high pressure and low temperature. Why ?
viii	How do you differentiate between effusion and diffusion of the gases ?
ix	Prove that $d = \dfrac{PM}{RT}$
x	How does the equilibrium constant of a reaction tell us the direction of a chemical reaction ?
xi	How can NaCl be purified by common ion effect ?
xii	What is pka ? How is it show the strength of an acid ?

QUESTION NO. 3 Write short answers of any Eight (8) parts of the following   16

i	What are dipole – dipole forces ?
ii	What do you mean by intermolecular forces ?
iii	Hydrogen bonding is present in chloroform and acetone. Justify it
iv	One feels sense of cooling under the fan after bath. Justify
v	What is the reason for the production of positive rays ?
vi	What happen when a free neutron decays ?
vii	Define frequency and wave number
viii	What is continuous spectrum ?
ix	What is percentage weight/weight ?
x	Define Molarity. Give its equation
xi	Define rate of reaction. Give its units
xii	Define velocity constant and give equation

QUESTION NO. 4 Write short answers of any Six (6) parts of the following   12

i	Why anionic radius is larger than parent atom ?
ii	Draw molecular orbital picture of He molecule
iii	Define Dipole moment and give its unit
iv	Explain angle in water is 104.5° instead of 109.5°
v	What is spontaneous and non-spontaneous process. Explain with example
vi	Define standard enthalpy of reaction. Give one example
vii	What is state function ? Give two examples
viii	What is the oxidation number of neutral molecule. Give one example
ix	Lead accumulator is a chargeable battery. Give reason

SECTION-II

Note: Attempt any Three questions from this section

Q.5 (A)	Describe combustion analysis to determine mass percentage of ' C ' , ' H ' and ' O ' in an organic compound	4
(B)	Write four defects in Bohr's atomic model	1× 4
Q.6 (A)	Describe the construction and working of fuel cells	2+1+1
(B)	A sample of nitrogen gas is enclosed in a vessel of volume 380 cm^3 at 120 °C and pressure of 101325 Nm^{-2}. This gas is transferred to a 10 dm^3 flask and cooled to 27 °C. Calculate the pressure in Nm^{-2} exerted by the gas at 27 °C	4
Q.7 (A)	Discuss structure of Ethyne (C_2H_2) w.r.t sp hybridization	4
(B)	Define enthalpy and also explain pressure – volume work	4
Q.8 (A)	What is vapour pressure. Discuss manometric method to measure the vapour pressure of liquid	1+3
(B)	Calculate the pH of a buffer solution in which 0.11 molar CH_3COONa and 0.09 molar acetic acid solution are present. Ka = 1.85×10^{-5} for CH_3COOH	1+3
Q.9 (A)	Differentiate between ideal and non-ideal solutions	1×4 = 4
(B)	How order of reaction can be found by half life method ?	4