P P SAVANI UNIVERSITY

Second Semester of Diploma Examination

June 2022

IDSH1050 Fundamentals of Chemistry

02.06.2022, Thursday **Time: 10:00 a.m. To 12:30 p.m.** **Maximum Marks: 60**

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in same answer sheet.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION – I

Q - 1 Answer the following MCQs. Choose only one option. **[07]**

(i) Which of the following are true for an element?

(I) Atomic number = number of protons + number of electrons
(II) Mass number = number of protons + number of neutrons
(III) Atomic mass = number of protons = number of neutrons
(IV) Atomic number = number of protons = number of electrons

(a) (I) and (II)
(b) (I) and (III)
(c) (II) and (III)
(d) (II) and (IV)

(ii) An atom with 3 protons and 4 neutrons will have a valency of

(a) 3
(b) 7
(c) 1
(d) 4

(iii) Ionic compounds are held together by

(a) intermolecular forces
(b) electrostatic forces
(c) magnetic forces
(d) nuclear forces

(iv) Lightest particle is

(a) Neutron
(b) Electron
(c) Proton
(d) None of these

(v) Neutron is a fundamental particle which have:

(a) +1 unit charge and 1 unit mass
(b) No charge and 1 unit mass
(c) Have no charge and mass
(d) Have -1 unit charge and 1 unit mass

(vi) What happens when an atom loses an electron?

(a) It becomes Negatively Charged
(b) It remains neutral because the proton also leaves.
(c) It becomes Positively Charged
(d) It stays the same.

(vii) Which of the following correctly represents the electronic distribution in the Mg atom?

(a) 3, 8, 1
(b) 2, 8, 2
(c) 1, 8, 3
(d) 8, 2, 2

Q - 2 (a) What is an atom? Give examples. **[03]**

Q - 2 (b) What is an ionic bond? **[03]**

OR

Q - 2 (a) Write down the differences between atoms and molecules. **[03]**

Q - 2 (b) What is a covalent bond? **[03]**

Q - 3 (a) What are the major differences between metals and non-metals? **[05]**

Q - 3 (b) Calculate the molecular mass of the following: **[05]**

(i) NaOH
(ii) KCl
(iii) $CaCO_3$
(iv) HNO_3
(v) NaCl

OR

Q - 3 (a) What are differences between sigma and Pi bond? **[05]**

Q - 3 (b) Define the octet rule. Write its significance and limitations. **[05]**

Q - 4 Attempt any **ONE.** **[06]**

(i) Convert the following molarities into normality:

(I) 1 M Na_2SO_4 = _____N
(II) 1.5 M $CaCl_2$ = _____N
(III) 0.5 M HCl = _____N
(IV) 1 M H_2SO_4 = _____N
(V) 2.2 M KOH = _____N
(VI) 1.1 M KCl = _____N

OR

(ii) How many liters of water (volume of solution) is needed to be added to 0.5 moles of $CaCl_2$ to make a 0.2 M solution (molarity) of $CaCl_2$.

SECTION – II

Q - 1 Answer the following MCQs. Choose only one option. **[07]**

(i) Substances that react with both acids and bases are called

(a) neutral
(b) conjugate bases
(c) amphoteric substances
(d) conjugate acids

(ii) A strong electrolyte is one which

(a) is completely ionized in the solution,
(b) dissociates partially in solution,
(c) is having low electrical conductivity
(d) ionizes partially.

(iii) Which of the following terms is not related with colloids?

(a) Dialysis

(b) Ultrafiltration
(c) Wavelength
(d) Brownian movement

(iv) A substance that donates a pair of electrons to form a coordinate covalent bond is called
(a) Lewis acid
(b) Lewis base
(c) Bronsted-Lowry acid
(d) Bronsted-Lowry base

(v) Smoke is an example of
(a) Gas dispersed in liquid
(b) Gas dispersed in solid
(c) Solid dispersed in gas
(d) Solid dispersed in solid

(vi) The acid used for the manufacture of fertilizers and explosives is
(a) nitric acid
(b) sulfuric acid
(c) phosphoric acid
(d) hydrochloric acid

(vii) Which one of the following will turn blue litmus red?
(a) Vinegar
(b) Lime water
(c) Baking soda solution
(d) Washing soda solution

Q - 2 (a) Write down the electrochemical series. **[03]**

Q - 2 (b) What is a neutralization reaction? Write a chemical equation to show the neutralization reaction. **[03]**

OR

Q - 2 (a) Differentiate between a strong electrolyte and a weak electrolyte. **[03]**

Q - 2 (b) What is the difference between acids and bases? Give strong examples. **[03]**

Q - 3 (a) Write down the electrolysis of molten lead bromide. **[05]**

Q - 3 (b) Describe the methods of preparation of a colloidal solution. Both dispersion method and condensation method. **[05]**

OR

Q - 3 (a) Write down the electrolysis of acidified water. **[05]**

Q - 3 (b) **BOTH** (I) and (II) have to be attempted in this choice.

(I) Define Brownian motion and the Tyndall effect. [Diagram is necessary] **[03]**

(II) Differentiate between a gel and an emulsion. [four differences] **[02]**

Q - 4 Attempt any **ONE**. **[07]**

(i) Write the key differences between Galvanic cells and electrolytic cells.

OR

(ii) Describe the construction of a galvanic cell.

****