Total No. of printed pages = 6

Sc-103/Chem-I(O)/1st Sem/2018/M

CHEMISTRY – I

(Old Course)

Full Marks – 70

Time – Three hours

The figures in the margin indicate full marks for the questions.

PART – A

Marks – 25

1. Fill in the blanks : 1×5=5

   (a) Molecular mass of silver is ———.

   (b) Isobars are atoms having different ——.

   (c) One Faraday = ——— Coulombs.

   (d) Electrode used in Daniell cell is ———.

   (e) Ionization energy of elements ——— from top to bottom of a group in periodic table.

[Turn over

2. Answer the following questions in one word or a sentence each : 1×5=5

(a) What is standard solution ?

(b) Define the term absolute zero.

(c) Give two examples of secondary cell.

(d) State the law of long form of periodic table.

(e) Isotope of an element contain 8P+7N and 8P+8N. What is the name of element ?

3. Write true or false of the following statements : 1×5=5

(a) The first ionization energy of magnesium is higher than aluminium.

(b) Electroplating is an application of electrolysis

(c) EDTA method is a process to remove hardness of water.

(d) P_H of water increases with increase in temperature.

(e) Methane molecule is tetrahedral.

4. Choose the correct answer from the following alternatives : 1×5=5

(a) Faraday is a unit of current /charge /voltage.

(b) Sodium carbonate is a neutral /acidic /basic salt.

(c) An atom becomes ion when there is gain of electron /loss of electron /gain or loss of electron.

(d) 1 ppm is equal to 1 mg/L / 10 mg/L / 100 mg/L.

(e) LPG is a gaseous / liquid / solid fuel.

5. Match the following : 1×5=5

(a) De-Broglie	(i)	used as promoter in ammonia manufacture by Haber process.
(b) Zero group	(ii)	Abnormal behaviour of water.
(c) Mo	(iii)	Halogen element.
(d) kW	(iv)	Dual nature of electron.
(e) Hydrogen bonding	(v)	Product of H+ ion and OH– ion.

PART – B

Marks – 45

Answer any *five* questions.

6. (a) What are redox reaction ? Give one example of redox reaction. 3

(b) Balance the following equation by partial method

$$HNO_3 + S \longrightarrow NO_2 + H_2SO_4 + H_2O.$$

3

(c) What are Isotopes and Isobars ? (Give with example) 3

7. (a) Find the equivalent mass of oxalic. 2

(b) Show that at NTP volume of all gases occupies 22.4 litre. 3

(c) 25ml of sodium carbonate solution is neutralised by 30ml of sulphuric acid containing 4.9 gram per litre. Calculate the strength of sodium carbonate solution in terms of normality and in grams per litre. 4

8. (a) What do you mean by acidity of a base and basicity of an acid ? 2

(b) State Avogadro hypothesis. 2

(c) Under similar conditions a gas diffuses twice as rapidly as CO_2. What is the molecular mass of the gas ? 3

(d) What are the significances of universal gas constant ? 2

9. (a) Classify catalytic reactions with example. 4

(b) State Faraday's 2nd law of electrolysis. 2

(c) A current of 10 amperes is passed through a dilute solution of H_2SO_4 in water for 6 minutes 26 seconds. Calculate the volume of hydrogen liberated in the electrode at NTP. 3

10. (a) How hard water can be soften by Zeolite process ? 4

(b) Draw the block diagram of municipal water treatment. 2

(c) List the problems faced while using hard water in boiler. 3

11. (a) State Law of mass action. Derive an expression for equilibrium constant for the reversible reaction. 4

(b) Write the electron dot structure of nitric acid and hydrogen peroxide. 3

(c) What is solubility product ? 2

12. Write short notes on the following : $3 \times 3 = 9$

(a) Electroplating.

(b) Buffer solution.

(c) Position of hydrogen in periodic table.