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**END SEMESTER / RETEST EXAMINATION, J/F
2023**

Semester : 1st

Branch : Common

Subject Code : Sc-103

CHEMISTRY – I

Full Marks – 70

Time – Three hours

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

Instructions :

- (i) *All* questions of PART – A are compulsory and objective types.
- (ii) Answer any *five* questions from PART – B.

PART – A

Marks – 25

1. Fill in the blanks :

1×5=5

(a) Temporary hard water contain _____ of
Ca and Mg.

(b) One Faraday = _____ Coulomb.

[Turn over

- (c) AlCl_3 is an example of _____ acid.
- (d) Nitrogen molecule contain _____ pi bond.

(e) Magnetic quantum number determines _____ of electrons.

2. Choose the correct answers :

$1 \times 5 = 5$

- (a) The boiling point of HF is greater than HCl due to the presence of
- (i) Ionic bond (ii) Covalent bond
- (iii) Hydrogen bond (iv) Dativ bond
- (b) One mole of Hydrogen gas is equal to
- (i) One gram of Hydrogen
- (ii) Two grams of Hydrogen
- (iii) One molecule of Hydrogen
- (iv) One litre of Hydrogen
- (c) Isotones are the elements having
- (i) Same number of protons
- (ii) Same number of electrons
- (iii) Same number of neutrons
- (iv) Same number of positrons

- (d) pH of 0.01(M) NaOH solution is
- (i) 10 (ii) 11
- (iii) 12 (iv) 13

(e) An aqueous solution of Sodium Carbonate is

- (i) Less acidic (ii) More acidic
- (iii) Alkaline (iv) Neutral.

3. Write short answers in one word/sentence each : $1 \times 5 = 5$

- (a) What is the relationship between E.C.E and C.E ?
- (b) Which element has the highest electron affinity ?
- (c) What is the oxidation number of Mn in KMnO_4 ?
- (d) What is the name of the catalyst that is used in the manufacture of Ammonia by the Haber's process ?
- (e) What is a decinormal solution ?

4. Match the following :

1×5=5

Column-A	Column-B
(a) Charle's Law	(i) Dynamic in nature
(b) Eriochrome black-T	(ii) Lone pair of electron
(c) Chemical Equilibrium	(iii) Volume-Temp relationship
(d) Ionisation Enthalpy	(iv) Hardness of water
(e) Ammonia	(v) Electron volt per atom

5. State True or False for the following statements :

1×5=5

- The addition of a catalyst does not change the state of equilibrium of a chemical reaction.
- KCN molecule contains only ionic bond.
- The conjugate acid of water is OH^- .
- In a Redox reaction oxidation and reduction take place simultaneously.
- 22 gm of CO_2 occupies 11.2 litres at S.T.P.

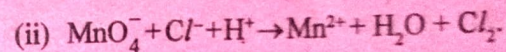
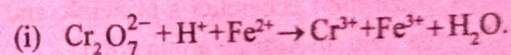
PART - B

Marks - 45

6. (a) State and explain Dalton's law of partial pressure. 2

(b) What is an ideal gas? Deduce the ideal gas equation $PV = nRT$ 1+3=4

(c) Balance the following equation by ion electron method (any one): 3



7. (a) Discuss the electronic concept of oxidation and reduction with examples. 2

(b) What is Normal solution and Molar solution? 2

(c) How much NaOH is to be dissolved in water to prepare 250 ml of 0.1(N) NaOH solution? 3

(d) What are the limitations of Bohr's atomic model? 2

8. (a) What are Quantum numbers? Discuss the physical significance of Quantum numbers. 1+3=4

(b) State the modern periodic law. What do you mean by periodicity in properties of elements? 3

(c) Draw the Lewis electron dot structure (any two): 2

(i) CO_2 , (ii) H_2O , (iii) NH_3 .

9. (a) What is homogeneous and heterogeneous catalysis? Explain with examples. 3

(b) State the Lecheticier's principle and describe its one industrial application. 3

(c) A current of 0.4 ampere strength passing through AgNO_3 solution for 5 minutes deposits 0.2122 gm of Ag. What is the E.C.E of Ag? 3

10. (a) State the differences between electrolytic cell and electrochemical cell. 3

(b) What are the difficulties arise in boiler when hard water is used? 2

(c) What is hardness of water? How the hardness of water is removed by Ion-Exchange method. 1+3=4

4/Sc-103/Chem-I/Ist Sem (6)

11. Write short notes on any three:

3×3=9

(a) Buffer solution

(b) Hydrogen bonding

(c) Conjugate acid-base pair

(d) Electron Affinity.

4/Sc-103/Chem-I/Ist Sem (7)

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