

Total No. of printed pages = 6

END SEMESTER EXAMINATION – 2021

Semester : 1st (New)

Subject Code : Sc-103

CHEMISTRY – I

Full Marks : 70

Time – Three hours

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

Instructions :

1. All questions on PART-A are compulsory
2. Answer any five questions from PART – B.

PART – A

Marks – 25

1. Fill in the blanks : 1×5=5
- (a) Atomic Radius _____ down a group.
- (b) NaHSO_4 is an example of _____ salt.
- (c) Permanent hard water contain _____ of Ca & Mg.

[Turn over

(d) 32 grams of Oxygen is equal to _____ mole.

(e) Sigma a bond is _____ than pi bond.

2. Answer the following questions briefly : $1 \times 5 = 5$

(a) What is the equivalent weight of H_2SO_4 ?

(b) What is the relation between K_p and K_c ?

(c) Which element has the highest electronegativity ?

(d) What is the SI unit of electric current ?

(e) What is catalytic poison ?

3. Choose the correct answer : $1 \times 5 = 5$

(a) p^H of 0.001M NaOH solution is

(i) 9 (ii) 10

(iii) 11 (iv) 12

(b) The oxidation number of Cr in $K_2Cr_2O_7$ is

(i) 5 (ii) 6

(iii) 7 (iv) 8

(c) The boiling point of HF is greater than HCl due to the presence of

(i) Ionic bond

(ii) Hydrogen bond

(iii) Covalent bond

(d) Magnetic quantum number determines

(i) Size

(ii) Shape

(iii) Orientation of electrons

(e) Conjugate acid of H_2O is

(i) H_3O

(ii) H_3O^+

(iii) OH^-

4. Write true or false : $1 \times 5 = 5$

(a) NH_4OH is an example of strong base.

(b) De-ionised water is sterilised water.

(c) d-orbital can accommodate 10 electrons.

(d) Faraday's 2nd law deals with E.C.E. of elements.

(e) Isotopes are the elements having same atomic number.

5. Match the following correctly :

1×5=5

(a) Aufbau principle	(i) Biological catalyst
(b) 6.023×10^{23} molecules	(ii) Charge
(c) Faraday	(iii) Water quality parameter
(d) B.O.D	(iv) Electronic configuration
(e) Enzyme	(v) One mole

PART - B

Marks - 45

6/ (a) Deduce the relation $PV = nRT$. 3

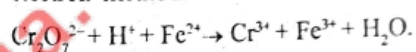
(b) Using Avagadro's hypothesis prove that $M = 2 \times D$ 3

(c) Calculate the number of moles and molecules present in 100 ml of CO_2 at N.T.P. 3

7. (a) Discuss the main postulates of Bohr's atomic model. 3

(b) Consider an electron is one of the 3rd orbital. Find out the value of n, l and m. 3

(c) Balance the following equation by ion electron method. 3



8. (a) What is ionisation energy? Discuss its variation in the periodic table. 3

(b) Write down the electron dot structure of the following (any three). 3

(i) H_2O_2 , (ii) CO_2 , (iii) NH_3 ,

(iv) $CaCl_2$, (v) N_2 .

(c) What are strong acid and strong base? Explain with examples. 3

9. (a) Explain Homogeneous and Heterogeneous catalysis with examples. 3

(b) State and explain Faraday's 1st and 2nd law of electrolysis. 3

(c) Write the differences between electrolytic cell and electro-chemical cell. 3

4/Sc-103/Chemistry-I(N) (5)

[Turn over

(b) Write the important characteristics of transitional elements. 3

(c) Differentiate ionic and covalent compounds. 4

(a) What is semiconductor? Give one example. 2

(b) Define buffer solution. Give one example of each of acidic and basic buffer. 4

(c) Name the catalysts used in synthesis of ammonia and sulphuric acid. 3

10. (a) State and explain Faraday's Second law of electrolysis. 3

(b) 5 amps current is passed through a silver nitrate cell for 3 hours. Calculate the amount of silver deposited at cathode.

[At. wt Ag = 108] 3

(c) Give the differences of electrolytic and electrochemical cell. 3

(a) Give the reasons of temporary and permanent hardness of water. 4

(b) Discuss the resin exchange method for deionisation of water. 5