

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 : $1 \times 5 = 5$
- (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 : $1 \times 5 = 5$

 - What is the equivalent weight of H_2SO_4 ?
 - What is the relation between K_p and K_c ?
 - Which element has the highest electronegativity ?
 - What is the SI unit of electric current ?
 - What is catalytic poison ?

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

 - p^{H} of 0.001M NaOH solution is
 - 9
 - 10
 - 11
 - 12
 - The oxidation number of Cr in $\text{K}_2\text{Cr}_2\text{O}_7$ is
 - 5
 - 6
 - 7
 - 8

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

 - NH_4OH is an example of strong base.
 - De-ionised water is sterilised water.
 - d-orbital can accommodate 10 electrons.

- (d) Faraday's 2nd law deals with E.C.L of elements.
- (e) Isotopes are the elements having same atomic number.

5. Match the following correctly : $1 \times 5 = 5$

| | |
|--------------------------------------|-------------------------------|
| (a) Aufbau principle | (i) Biological catalyst |
| (b) 6.023×10^{28} 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

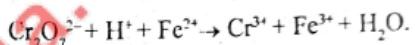
- 6/ (a) Deduce the relation $PV = nRT$. 3
- (b) Using Avagadro's hypothesis prove that $M = 2 \times D$ 3
- (c) Calculate the number of moles and molecules present in 100 ml of CO_2 at N.T.P. 3

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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

(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

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

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