Roll No. | | | | | | | | | | | | | **Total No. of Pages : 02**

Total No. of Questions : 09

B.Sc - Honours (Mathematics) (Sem.–3)

PHYSICAL CHEMISTRY

Subject Code : UC-BHCL-I-204-19

M.Code : 78504

Date of Examination : 21-12-22

Time : 3 Hrs. **Max. Marks : 60**

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION - B & C. have FOUR questions each.**
3. **Attempt any FIVE questions from SECTION B & C carrying EIGHT marks each.**
4. **Select atleast TWO questions from SECTION - B & C.**

SECTION-A

1. Write briefly :

a) What is Avogadro's Law? Explain.

b) What are Arrhenius Acids and Bases? Give Examples.

c) What is Law of Rational Indices?

d) Enlist postulates of Kinetic Gas Equation.

e) What is Axis of Symmetry? Explain with example.

f) Calculate the pH of 0.05 M HNO_3 solution.

g) What is the difference between osmosis and osmotic pressure?

h) What is the cause of deviation from ideal gas behaviour?

i) How does temperature affect coefficient of viscosity?

j) The boiling point of benzene is 353.23K. When 1.80g of non-volatile solute was dissolved in 90g of benzene, the boiling point is raised to 354.11 K. calculate the molar mass of solute. K_b for benzene is 2.53K kg mol^{-1}.

SECTION-B

2. How vander waal Equation of state for real gases explains behaviour of real gases under different conditions.

3. What is compressibility factor Z ? How it shows variation with pressure for different gases?

4. a) Discuss the cleansing action of detergents.

   b) What are seven crystal system? Explain.

5. a) Give the point of differences between crystalline and amorphous solid.

   b) How surface tension can be determined experimentally?

SECTION-C

6. a) Derive the thermodynamic expression for elevation in boiling point.

   b) Calculate the osmotic-pressure of 0.01 M solution of canesugar st 27°C (R=0.0821litre atm 3 /degree/mol)

7. a) A solution containing 2,44g of solute dissolved in 75g of water boiled at 100.413 °C . Calculate the molar mass of solute. (K^b for water = 0.52 K kg mol^{-1})

   b) Write expression for the Raoulf s law for non-volatile solutes.

8. Explain any three applications for solubility product principle.

9. What is ionic product of water? Write the expression and also explain the dissociation constant of mono, di and triprotic acids.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.