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**SUBJECT CODE NO:- B- 2007**  
**FACULTY OF SCIENCE AND TECHNOLOGY**  
**B.Sc. F.Y. (Sem-II)**  
**Examination November/December- 2022**  
**Chemistry Paper-IV**  
**(Physical Chemistry)**

[Time: 1:30 Hours]

[Max. Marks:50]

Please check whether you have got the right question paper.

- N.B
1. Attempt all questions.
  2. Draw diagram wherever necessary.
- Q.1 Explain postulates of kinetic theory of gases. Deduce Avogadro's law and Graham's law of diffusion. 20
- OR**
- Derive Bragg's equation. Discuss in detail laws of crystallography. 20
- Q.2 Explain factors affecting the rate of reaction. 20  
 Derive integrated rate equation for first order reaction.
- OR**
- Write short note on any four 20
- a) Calculate the distance between two points lying on a straight line
    - i) (-4, 3) and (2, -3)
    - ii) (-2, 4) and (5, 4)
  - b) Using logarithms, solve
    - i)  $797 \div 110$
    - ii)  $619 \times 321$
  - c) Differentiate between solid and gases
  - d) Nematic and cholesteral liquid crystals
  - e) Emulsion and its types
  - f) Enzyme catalysis.
- Q.3 Multiple choice questions. 10
- 1) The ideal gas equation  $PV = \text{-----}$ 
    - a)  $nT$
    - b)  $nR$
    - c)  $nRT$
    - d) None of these
  - 2)  $V \propto T$  is ----- law
    - a) Charl's
    - b) Boyle's
    - c) Avogadro's
    - d) Graham's

- 3)  $k = \frac{1}{ta} \cdot \frac{x}{(a-x)}$  represents ----- order of reaction.  
a) Zero                      b) First                      c) Pseudo                      d) Second
- 4) The rate of reaction increases with the ----- of temperature.  
a) Decrease                      b) Increase                      c) Both a & b                      d) None of these
- 5) P-cholesteryl benzoate is an example of -----  
a) Solid                      b) Liquid                      c) Gases                      d) Liquid crystal
- 6) Ice-cream is an example of -----  
a) Emulsion                      b) Gel                      c) Aerosol                      d) Sol
- 7)  $n\lambda = 2d\sin\theta$  represents ----- law  
a) Boyle's                      b) Charles's                      c) Bragg's                      d) Both a & b
- 8) HCl is a ----- molecule  
a) Polar                      b) Non-polar                      c) Both a & b                      d) None of these
- 9)  $\text{Log } 300 =$  -----  
a) 1.00                      b) 2.00                      c) 3.00                      d) 4.00
- 10) The slope and intercept of the line  $x + 2y + 6 = 0$  is -----  
a)  $(\frac{1}{2}, 3)$                       b)  $(-\frac{1}{2}, -3)$                       c)  $(\frac{-1}{2}, 3)$                       d)  $(\frac{1}{2}, -3)$