

B.Sc. (Part-I) EXAMINATION – 2019
CHEMISTRY
Paper Third : Physical Chemistry

Note : Attempt questions from all Sections as per instructions.

Section – A (Very Short Answer Type Questions)

Note : Attempt all parts of this question. Give answer of each part about 50 words. **1 × 10 = 10**

- (i) Evaluate \log_3^{243} .
- (ii) Find $\left(\frac{\partial Z}{\partial X}\right)_y$, When $Z = \sin^2 x^2 y$
- (iii) Distinguish between Hardware and Software.
- (iv) What is ASCII Code ?
- (v) What is electrophoresis?
- (vi) CH_4 has higher polarizability than water, but boiling point of water is higher, why ?
- (vii) Define 'Critical temperature'.
- (viii) What is instantaneous reaction? Give example.
- (ix) What is 'autocatalysis'?
- (x) Who gave the relation $n\lambda = 2d \sin \theta$ ($n\lambda = 2d \sin \theta$)? What are the various term?

Section – B (Short Answer Type Questions)

Note : Attempt all questions. Give answer of each question in about 200 words. **5 × 5 = 25**

2. Evaluate :
 - (i) $\tan^2 X dx$
 - (ii) $\int e^{-\ln x} dx$**Or**
Find $\frac{8!}{5!}$ and $\frac{14!}{4! \times 10!}$
3. If Collision diameter of N_2 molecules is 374 pm. Find collision number in the above example of gas. **Or**
Derive Vander Waals gas equation for an ideal gas.
4. What are Colloidal electrolytes? Explain. **Or**
Lyophobic Sols show electrophoresis. Explain.

5. Derive the rate Law of IInd order reaction $2A \rightarrow P$. Or
(100) and (110) Planes of NaCl Crystal give maximum reflection of X-rays at angles θ_1 and θ_2 . Using Bragg's equation determine the ratio d_{100}/d_{110} .
6. What are Miller Indices? How are they determined? Give example. Or
What are radial distribution function? How it is used for elucidation of structure of liquid?

Section - C (Long Answer Type Questions)

Note : Attempt any two questions. Give answer of each question in about 500 words. 7 1/2 x 2 = 15

7. Briefly describe the high level languages Viz., FORTRAN, BASIC, PASCAL and COBOL.
8. What is half life of a reaction? Derive expression for the half life of zero order and 1st order reaction. How do the $t_{1/2}$ values depends upon the initial concentration of these reaction.
9. Derive Bragg's equation for X-ray diffraction and discuss the determine of the Crystal Structure of NaCl.
10. Short Notes on :
(i) Dipole-Dipole Interaction.
(ii) Maxwell distribution of molecular velocities.
(iii) Poisoning of Catalysts
11. What is Kinetic theory of gases. Write down the important Postulates of gases and derive the relationship $Pv = \frac{1}{3} mNu^2$.

