(i) Printed Pages : 4 **Roll No. .....**

(ii) Questions : 9 **Sub. Code :** 0 0 5 0

Exam. Code: 0 0 0 1

B.A./B.Sc. (General) 1st Semester

1124

CHEMISTRY(Same for B.Sc. Microbial and Food Technology)

Paper-III: Physical Chemitry-A

Time Allowed : Three Hours] **[Maximum Marks : 45**

Note :- Attempt **five** questions selecting **one** from each Section. All questions carry equal marks. Section E is compulsory. Simple/Non-programmable calculator is allowed. Subparts of 9th question carry 1 mark each.

SECTION-A

1. (a) Define mean, mode and median. 3
   (b) Differentiate between determinate and indeterminate error. 2
   (c) Discuss Linear least square method for curve fitting. 2
   (d) Find the differential of $(3x^2+1)^2$ w.r.t. x. 2

OR

2. (a) Find the value of 11^{th} root of 25.69. 2
   (b) Describe the method to find maxima and minima of function f(x). 3
   (c) What is meant by confidence limit and confidence interval? 2

(d) What are Standard Deviation and Variance ? 2

SECTION-B

3. (a) Discuss the concept of Maxwell's drstnbutlon of molecular velocities. Also, tell the effect of temperature on this distribution. 4

(b) Explain the PV isotherms of CO_2 an derive correlations between critical constants and van der Waal's constant. 4

(c) What is compressibility factor ? 1

OR

4. (a) What are the postulates of Kinetic theory of gases ? How is Kinetic gas equation derived from these postulates? 3

(b) Van der Waal's constants of a gas are a = 0.751 dm^6 atm Mol^{-2}, b = 0.0226 $dm^3 mol^{-1}$. Calculate its critical constants. 3

(c) Show that at Boyle's Temperature, Van der Waal equation is reduced to Ideal gas equation. 3

SECTION-C

5. (a) What is order of a reaction ? Discuss any two methods by Which order of a reaction can be determined. 4

(b) What is a pseudo order reaction ? Give an example. 2

(c) Derive rate equation for an element showing Radioactive decay. 3

OR

6. (a) The half-life of C-14 is 5760 years. Find the value of its disintegratlon constant in S.I. units. 2

(b) Discuss the effect of temperature on reaction rates. 2

(c) What is rate constant of a reaction ? Write the units of rate constant for zero, first, second order and third order reactions. 3

(d) What is an instantaneous reaction ? Give example. 2

SECTION-D

7. (a) Discuss transition theory of reaction rates. 4

(b) Describe Arrhenius equation for temperature dependence of reaction. How is activation energy determined ? 3

(c) What are catalytic promoters ”and inhibitors ? 2

OR

8. (a) Discuss Activated Complex Theory of bimolecular reactions. 3

(b) Rate constant of a reaction at 27°C and 37°C is $4.5 \times 10^{-5} s^{-1}$ and $9 \times 10^{-5} s^{-1}$. Calculate E_a of reaction. 2

(c) What is a catalyst ? What is meant by Autocatalysis ? 2

(d) Discuss the effect of pressure on reaction rate. 2

SECTION-E

9. (a) Define Precision.

(b) Evaluate $\log_2 64$.

(c) What is most probable velocity ?

(d) Define Collision number.

(e) What is meant by critical temperature ?

(f) What is average rate of reaction ?

(g) What is the reason that third order reactions are less common?

(h) What is homogeneous catalysis ?

(i) Define Law of Mass action. 9x1=9