THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1.   **Answer the following short questions.**   **(15x2=30)**

I   How can you determine pre-exponential factor from Arrhenius equation.

II   What is effect of temperature on rate constant?

III   What are ionic reactions?

IV   What do you understand by cage effect?

V   What are ideal gases?

VI   Describe most probable velocity

VII   Reactions in solution phase are faster than gas phase. Why?

VIII   Derive root mean square velocity from Maxwell distribution law.

IX   Write down Nernst approximation formula.

X   Give two statements of 2nd law of thermodynamics.

XI   What is the effect of temperature on vertical distribution of gas?

XII   What is meant by degree of freedom?

XIII   Give mathematical formulation of Barometric formula

XIV   Describe term Clausis in-equality.

XV   Define the term microstate.

Answer the following questions.

Q.2	(a)	Derive expression for Sterling approximation.	(5)
	(b)	Prove that $Q = Q_t.Q_r.Q_v.Q_e$	(5)
Q.3	(a)	State and explain 3rd law of thermodynamics.	(5)
	(b)	Prove third law of thermodynamics experimentally.	(5)
Q.4	(a)	Give five postulates of transition state theory.	(5)
	(b)	Derive Erying equation on the basis of postulates of transition state theory.	(5)