

Roll No.

--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

Total No. of Pages : 02

Total No. of Questions : 09

B.Sc.(BT) (2014 to 2017) (Sem.-2)

PHYSICAL CHEMISTRY

Subject Code : BSBT-106

M.Code : 47012

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A**1. Write briefly :**

- a) Define Zeroth law of thermodynamics. Give its important application.
- b) What is thermodynamic basis of Hess law?
- c) What is the basis of thermodynamic scale of temperature? Why is it more basic than that based on ideal gas?
- d) What is meant by triple point of water? Why is it different from normal melting point of ice?
- e) What is the difference between eutectic point and cryohydric point?
- f) Why all the four phases cannot exist together in sulphur system?
- g) How can you justify that osmotic pressure is a colligative property?
- h) Which colligative property is used for finding the molecular masses of polymers and why?
- i) Briefly explain the effect of solvent on the rate of reaction.
- j) Derive the expression for decay constant of a radioactive substance.

SECTION-B

2. Derive expressions for ΔH and ΔE for adiabatic reversible expansion of a real gas.
3. What is Carnot cycle? How does it lead to the definition of entropy?
4. Draw and explain a phase diagram for one component system comprising more than one solid phase.
5. Write a detailed note on pseudo-order reactions.
6. Derive thermodynamically the expression for relative lowering in vapour pressure.

SECTION-C

7.
 - a) Discuss in details the phase diagram for KI-H₂O system.
 - b) Calculate the activation energy of a reaction whose reaction rate at 27°C gets doubled for 10°C rise in temperature.
8.
 - a) After 24 hours, only 0.125 g out of the initial quantity of 1 g of a radioactive isotope remains behind. What is its half-life period?
 - b) Write a detailed note on acid base catalysis.
9.
 - a) A solution contains 6 g of a solute dissolved in 250 ml of water gave an osmotic pressure of 4.5 atm at 27°C. Calculate the boiling point of the solution. The molal elevation constant of water is 0.52 K Kg/mol.
 - b) Write a detailed note on Nernst heat theorem.

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.