

II B.Tech I Semester (R07) Supplementary May 2012 Examinations
THERMODYNAMICS FOR BIOTECHNOLOGISTS
(Biotechnology)

Time: 3 hours**Max. Marks: 80**

Answer any FIVE questions
All questions carry equal marks

1. (a) Explain the first law of thermodynamics.
(b) Water flows over a water fall 100 mm height. Consider 1 kg of the water & assume that no energy is exchanged between the 1 kg & its surroundings.
 - (i) What is the potential energy of the water at the top of the falls with respect to the base of the falls?
 - (ii) What is the kinetic energy of the water just before it strikes bottom?
2. Explain the stoichiometry of growth & product formation.
3. Explain heat of combustion with one example and explain the effect of temperature.
4. (a) With a neat diagram explain plug flow reactor.
(b) Explain in detail about fed batch reactor.
5. Derive all the Maxwell equations.
6. (a) Explain in brief the effect of pressure & temperature on equilibrium constant.
(b) Explain about single & multiple reactions.
7. Discuss solid vapor equilibrium & its related equations.
8. (a) Define phase rule & state Duben's theorem for equilibrium phases.
(b) Explain in brief heat of combustion with one example.
