COURSE CODE (CREDITS): 18B11BT313 (4)

COURSE NAME: Thermodynamics and Chemical Processes

COURSE INSTRUCTORS: Dr. Poonam Sharma

MAX. MARKS: 15

MAX. TIME: 1 Hour

Note: All questions are compulsory. Marks are indicated against each question in square brackets.

Q1(a). Elaborate the principles of bioenergetics which are useful for transformation of biological energy.

3[CO –II]

(b). Coupling of reactions is important concept of bioenergetics. Justify. 2[CO –II]

Q2(a). The properties of a certain fluid are related as $E = 196 + 0.718T$, $PV = 0.287(T + 273)$ where E is the internal energy (KJ/Kg), T is temperature in °C, P is pressure (kN/m^2) and V is volume (m^3/kg). For this fluid find Cv and Cp.

2[CO –I]

(b). Enumerate the increase in entropy of 1 kg of ice (0°C) when it is converted into steam (100°C). Given that the specific heat of water is 1 kcal kg °C, latent heat of ice is 80 kcal/kg and the latent heat of steam is 540 kcal/kg, specific heat of ice is 0.5kcal kg °C.

3[CO –I]

Q3(a). Elaborate the importance of lineweaver-burk plot and langmuir plot from Michaelis-Menten kinetics for the calculation of Vmax and Km.

3[CO –III]

(b). Elucidate the importance and limitations of Thermodynamics. 2[CO-I]