Dr Poonam Chauhan

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T1 EXAMINATION- Sept 2018

B.Tech (BT) III[rd] Semester

COURSE CODE: 10B11BT311 MAX. MARKS:15

COURSE NAME: Thermodynamics and Chemical processes

COURSE CREDITS: 4 MAX. TIME: One Hour

Note: *All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

Q1(a). Coupling of reactions is important concept of biology. Justify. 2

(b). Elaborate the principles of bioenergetics which are useful for transformation of biological energy. 3

Q2(a). One mole of an ideal monoatomic gas at 300 K expanded reversibly and adiabatically. The final temperature recorded was 189K. Calculate work done in the process. (If Cv =3/2R). 2

(b). Calculate the increase in entropy of 1 kg of ice (0^{O}C) when it is converted into steam (100^{O}C). Given that the specific heat of water is 1 kcal kg ^{0}C, latent heat of ice is 80 kcal/kg and the latent heat of steam is 540 kcal/kg, specific heat of ice is 0.5 kcal kg ^{0}C. 3

Q3(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 ^{o}C, P is pressure (kN/m^2) and V is volume (m^3/kg). For this fluid find Cv and Cp. 2

(b). How lineweaver-burk plot and langmuir plot from Michaelis-Menten kinetics are useful for the calculation of Vmax and Km. 3