JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- SEPT 2018
B.Tech V Semester

COURSE CODE: 15B11BT511

MAX. MARKS: 15

COURSE NAME: BIOPROCESS ENGINEERING

COURSE CREDITS: 04

MAX. TIME: 1 Hr.

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

1. What do you understand by Bioprocess Engineering? What is your role in an industry as a Bioprocess Engineer? [2]

2. Define the following theoretically and mathematically: [4]

   a) Residence Time

   b) Productivity

   c) Yield

   d) Saturation Constant

3. Differentiate between following: [2]

   a) Steady State and Quasi Steady State

   b) Quality Control and Quality Assurance

4. Prove that Dilution Rate (D) = Specific Growth Rate (μ) in a chemostat at Steady State. [2]

5. Though Chemostat shows higher productivity as compared to Batch process, even so, most industrial fermentation processes occur in a batch reactor. Why? [2]

6. In a Fed-batch culture operating with intermittent addition of glucose solution, values of the following parameters are given at time = 2 h, when the system is at quasi-steady state (Q.S.S.). [1+2]

   V = 1000 ml, F = 200 ml/h, S_o = 100 g glucose/l, K_s = 0.1 g glucose/L, μ_{max} = 0.3 h^{-1},

   $Y_{x/s}$ = 0.5 g dw cells/ g glucose

   a) Find the initial volume of the culture.

   b) Determine the concentration and total amount of biomass in the vessel at t = 2 h at Q.S.S.