

COURSE CODE (CREDITS): 18B11BI312 (4)

MAX. MARKS: 25

COURSE NAME: MICROBIOLOGY & IMMUNE SYSTEM

COURSE INSTRUCTORS: Dr. Rahul Shrivastava

MAX. TIME: 1 Hour 30 Minutes

Note: (a) All questions compulsory. (b) Marks are indicated against each question in square brackets. (c) Calculators are NOT allowed, all steps of the numerical to be done in the answer sheet only.

Q1. A bacterial broth culture medium has 12 cells /mL as inoculum, with a 20 min generation time, how many cells would there be in 1 liter of the culture after:

(CO – III) [1+1+2 =4]

- i) 1 hour
- ii) 3 hour if lag phase is of 2 hour
- iii) After 3 hour if lag phase is of 1 hour, and 50% of the initial 12 cells were dead after log phase.

Q2. Give reasons **FOR** the following statements provided: (in not more than 50 – 60 words).

(CO-II) [1 X 6 = 6]

- a. High concentration of salt in pickles increases its shelf life.
- b. Glucose used in culture media is sterilized by filtration instead of autoclaving.
- c. Copper sulphate is used to control algal growth in pools and fish tanks.
- d. The 'streak plate' is a better technique than 'pour plate' methods to obtain pure culture of a bacterial culture.
- e. Fungi are usually responsible for spoilage of acidic foods.
- f. Pour plate method cannot be used to determine CFU counts of bacterial cells.

Q3. Draw labeled diagrams of Gram-negative and Gram-positive and cell walls. Give important differences between Gram-negative and Gram-positive bacteria.

(CO – IV) [4]

Q4. Draw a typical bacterial growth curve and discuss various phases of the curve, along with their significance.

(CO - I) [5]

Q5. You are exposed to various physical and chemical microbial control methods in your daily life. Mention an account of all possible microbial control methods which you use or come across on a particular day, along with their mechanism of action.

(CO - V) [6]