

## JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- October 2017

B.Tech (Biotechnology) III<sup>rd</sup> Semester

Open Book Test

COURSE CODE: 10B11BT313

MAX. MARKS: 25

COURSE NAME: Microbiology

COURSE CREDITS: 4

MAX. TIME: 1.5 Hrs

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

Q1: You are given a task to estimate the microbial diversity (all possible type of microbial life) of our Mughal Garden soil at JUIT, Wagnaghat. How will you proceed, elaborate all steps. 05

Q2: How will you determine the following:-

- Bacterial load of fermenter at hourly interval.
- Fungal load of water which is thought to be almost pure
- You have a culture with 1200 cells; it is going through experimental decline at a rate of 50% die-off per minute. After 3 minutes; how many viable cells are left? 05(2+2+1)

Q3: A single cell of *Thermus aquaticus* and *Lactobacillus sp.* were incubated separately in nutrient broth media, pH 7.4. Draw the tentative growth curves for both under the following temperature gradient and discuss the pattern.

1<sup>st</sup> hr - 25°C

2<sup>nd</sup> hr - 35°C

3<sup>rd</sup> hr - 45°C

4<sup>th</sup> hr - 55°C

5<sup>th</sup> hr - 65°C 05

Q4: a) Suppose you want to determine the occurrence of the vitamin biotin in a batch of milk. *Leuconostoc sp.* requires biotin for growth. Using this bacterium and a chemically defined medium to which a small sample of sterilized milk can be added. Devise an experiment that could indicate whether biotin is present in milk.

b) Alcohol is used as a disinfectant to human skin. Devise an experiment to test this hypothesis.

c) Devise a strategy to prolonged stationary phase of the bacterial culture. 05(2+2+1)

Q5: a) What difficulty might exist in sub culturing the colony of a desired organism from a selective agar medium? What additional steps should be taken to assure culture purity?

b) *Pseudomonas putida* and *E. coli* are growing in same flask having chemically defined medium at 37°C; Is it possible to estimate their growth pattern individually? Justify your answer.

c) Devise an enrichment procedure for a facultative anaerobic bacteria using methane gas as sole source of carbon. Elaborate all steps. 05(2+2+1)