

PARUL UNIVERSITY
FACULTY OF APPLIED SCIENCE
M.Sc. Summer 2017-18 Examination

Semester: 4**Subject Code: 11201252****Subject Name: Industrial Microbiology & Fermentation Technology****Date: 10/05/2018****Time: 02:00 pm to 04:30 pm****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

- Q.1. A) Essay type (Each of 04 marks) (08)**
- (a) Explain the basic design of a fermentor. List different types of fermentors.
 - (b) Describe selection and screening of micro-organisms through primary screening
- Q.1. B) Answer the following questions (Any two) (04)**
- (a) Short note (Each of 02 marks) (04)
 1. Explain photobioreactor
 2. Explain air lift fermentor
 - (b) Short note on range of fermentation processes. (04)
 - (c) Short note scale up of fermentation process (04)
- Q.2. A) Answer the following questions. (04)**
- (a) Fill in the blanks. (Each of 02 marks) (04)
 1. _____ device is use to supply sterile air in the fermentation vessel during aerobic fermentation process?
 2. A _____ is composed of population of cell that are at the same stage of their cell cycle
 - (b) Short note on recovery and purification of fermentation products. (04)
- Q.2. B) Answer the following questions (Any two) (03)**
- (a) Multiple choice questions. (Each of 01 marks) (03)
 1. In batch fermentation

A. substrates are added to the system all at once and runs until product is harvested.	B. nutrients are continuously fed into the reactor and the product is siphoned off during the run.
C. new batches of microorganisms are screened for increased yield.	D. small-scale production is used to synthesize product.
 2. Main aim of inoculum preparation is

A. To minimize contamination	B. To increase production
C. To decrease lag phase of desired organisms	D. All of the above
 3. Which of the following methods is not used for the improvement of bacterial strain?

A. Parasexual cycle	B. Conjugation
C. Protoplast fusion	D. Recombinant DNA technology
 - (b) Short note on secondary screening (03)
 - (c) Short note on lyophilization (03)
- Q.3. A) Essay type (Each of 04 marks) (08)**
- (a) Describe in detail parameters of ideal fermentor
 - (b) Describe strain improvement of industrially important microorganisms.
- Q.3. B) Answer the following questions (Any two) (04)**
- (a) Short note (Each of 02 marks) (04)
 1. Short note on control of various parameters in fermentor
 2. Explain packed bed column fermentor .
 - (b) Give the difference between fed batch and continuous culture. (04)
 - (c) Short note on production of antibiotics (04)

Q.4. A) Answer the following questions.

(a) Fill in the blanks. (Each of 02 marks) (04)

1. Microbial population maintained in _____ phase for long time using continuous culture system.
2. _____ serve dual purpose of aeration and agitation in fermentor.

(b) Short note on alcohol fermentation (04)

Q.4. B) Answer the following questions (Any two)

(a) Multiple choice questions. (Each of 01 marks) (03)

1. A fed batch process is a
 - A. Closed system
 - B. Continuous system
 - C. Intermittently fed system
 - D. Stationary system
2. Filter used for the filtration in fermentation should be
 - A. Sterilizable
 - B. Hydrophobic
 - C. Both A and B
 - D. None of the above
3. 'Del Factor' is represented as
 - A. $\ln N_0/N_t$
 - B. $A \cdot e^{-E/RT}$
 - C. E/RT^2
 - D. kN

(b) What is diauxic growth? (03)

(c) Short note on sterilization (03)