PARUL UNIVERSITY
FACULTY OF APPLIED SCIENCE
M.Sc. Summer 2022-23 Examination

Semester: 4   Date: 22-03-2023
Subject Code: 11202253   Time: 2:00pm to 4:30pm
Subject Name: Bioprocess engineering and techniques   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/ Brief note (4x2) (Each of 04 marks)   **(08)**
   (a) Detailed description of different parts of fermentor with diagram of fermentor
   (b) Describe strain improvement of industrially important microorganisms.

Q.1. B) Answer the following questions (Any two)
   (a) Short note/ Brief note (2x2)/ Schematically label the figures (2x2) (Each of 02 marks)   **(04)**
      1. List different types of fermentors
      2. Brief note on primary screening
   (b) Differentiate between fed batch and continous culture   **(04)**
   (c) Short note on packed bed reactor   **(04)**

Q.2. A) Answer the following questions.
   (a) Short note/ Brief note (2x2)/ Fill in the blanks. (Each of 02 marks)   **(04)**
      1. Microbial population maintained in _____ phase for long time using
         continuous culture system.
      2. _____disrupt vortex and provide better mixing
   (b) Short note on production of Streptomycin   **(04)**

Q.2. B) Answer the following questions (Any two)
   (a) Short note/ Multiple choice questions.   (Each of 01 marks)   **(03)**
      1. Which of the following is used for agitation and vigorous stirring of media?
   A. Spindle   B. Sparger
   C. Motor   D. Impeller
      3. The region of an airlift bioreactor in which the liquid travels in a downward
         direction is called the
     A. Downcomer   B. Disengagement zone
     C. Air riser   D. Flowing region
      4. Microbes are improved in industry for
  A: Better product   B: High yield
   C: Stability of organism   E. All the above
   (b) Short note on filtration   **(03)**
   (c) Short note on liquid liquid extraction   **(03)**

Q.3. A) Essay type/ Brief note (4x2) (Each of 04 marks)   **(08)**
   (a) Short note on Beer production
   (b) Short note on amylase production
Q.3. B) Answer the following questions (Any two)
   (a) Short note/ Brief note (2x2)/ Schematically label the figures (2x2) (Each of 02 marks)   **(04)**
      1. Brief note on reverse osmosis
      2. Brief note on cell disruption
   (b) Describe in treatment of effluent and its disposal   **(04)**
   (c) Short note on wine production   **(04)**

Q.4. A) Answer the following questions.
    (a) Short note/ Brief note (2x2)/ Fill in the blanks. (Each of 02 marks)   **(04)**
        1. Lyophilisation is also known as_____
        2. A _____ is composed of population of cell that is at the same stage of their cell cycle
    (d) Short note on production of citric acid   **(04)**

Q.4. B) Answer the following questions (Any two)
    (a) Short note/ Multiple choice questions.   (Each of 01 marks)   **(03)**
        1. Screening of microorganisms includes

A. one or few steps	B. Allow discarding of many valueless microbes
C. Easy detection of the small percentage of useful microorganism	D. All of the above

        2. Primary screening detects

A. The structure of product	B. toxicity of product
C. The organisms producing the product	D. none of the above

        3. Fermentor for fermentation process should be _____

A: Able to withstand high temperature	B: Able to withstand high pressure
C: Able to resist corrosion	D: All of the above

    (b) Short note on recovery and purification of ethanol.   **(03)**
    (c) Short note on acetic acid production.   **(03)**