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SEAT No._____ **No. of Printed Pages: 02**

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Sardar Patel University
M. Sc. IGBT, Eighth Semester Examination
Thursday, 12th April, 2018
02:00 p.m. – 05:00 p.m.
***PS08CIGGB2*: Bioprocess Engineering and Technology**

Total Marks: 70

Q1. Multiple Choice Questions (Attempt all questions). [8]

(i) Freeze drying is used for
(a) Sterilization (b) Strain improvement
(c) Culture preservation (d) None

(ii) The del factor increases as the final number of cells
(a) Decreases (b) Increases (c) Zero (d) Constant

(iii) The mechanical means of accomplishing sterilization of fermentation media/equipment is
(a) Ultrasonic (b) Chemical agents (c) Radiation (d) All of these

(iv) The highest temperature which appears to be feasible for batch sterilization is
(a) 121°C (b) 100°C (c) 105°C (d) 130°C

(v) In a fermeter_____prevents vortex formation and improves aeration efficiency.
(a) Impellar (b) Baffles (c) Sparger (d) Stirrer glands

(vi) The uniform mixing of nutrients in a fermenter vessel is obtained with the help of
(a) Baffle (b) Impellar (c) Sparger (d) All of these

(vii) K_{La} is a
(a) Mass transfer coefficient (b) OTR
(c) Volumetric oxygen transfer coefficient (d) Critical oxygen level

(viii) OTR =
(a) (C^*-C_L) (b) dC_L/dt (c) $K_{La}. C^*$ (d) None

Q2. Attempt any seven of the following: [14]
(i) Define role of chelators in fermentation media with two examples.
(ii) Explain the significance of Del factor
(iii) Define Chemostat
(iv) What is fed batch fermentation?
(v) Explain Bingham plastic rheology.
(vi) Write a note on Absolute filter?
(vii) Explain Reverse Osmosis.
(viii) What is Cross flow filtration?
(ix) Explain containment.

Q3(A) What is an aerator? How many types of aerators are there? Explain any two with [6]

suitable diagram.

Q3(B) Explain various nitrogen sources used in fermentation media. [6]

OR

Q3(B) Explain carbon sources used in fermentation media. [6]

Q4(A) Discuss the purpose and design of pilot scale fermentor. [6]

Q4(B) Justify: Same degree of sterilization can be achieved over a time-temperature regime. [6]

OR

Q4(B) Justify: Nutrient inactivation can be minimized by careful selection of time-temperature regime. [6]

Q5(A) List various types of Controls and discuss PID in detail. [6]

Q5(B) Discuss the kinetics of a batch culture. [6]

OR

Q5(B) Discuss the kinetics of a variable volume fed-batch culture. [6]

Q6(A) Discuss cell separation by Centrifugation. [6]

Q6(B) Write a note on HPLC as a tool for downstream processing. Give pros and cons. [6]

OR

Q6(B) List various methods for cell disruption. Explain any two in detail. [6]

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