



End Semester Examination – Nov/Dec – 2016

Code : 14BT2009
Sub. Name : Bioprocess Principles

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks																								
1.	a.	Discuss in detail the configuration of a fermentor with a neat diagram.	CO-1	1 5																								
(OR)																												
2.	a.	Explain in detail various stages in development of fermentation industry also tabulate various process control, vessels used and modes of operation of these process in detail	CO-1	1 5																								
3.	a.	Explain the process of media formulation for the industrial production of penicillin antibiotics	CO-3	1 5																								
(OR)																												
4.	a.	For the following data calculate the difference, average difference, mean square, experimental error and factors showing larger effect. <table border="1"><tr><th>Factor</th><th>Carbon</th><th>hormones</th><th>Vitamin</th><th>Mineral</th><th>Nitrogen</th><th>Dummy1</th><th>Dummy2</th></tr><tr><td>Σ(H)</td><td>4.9</td><td>24.5</td><td>6.7</td><td>9.3</td><td>9.7</td><td>13</td><td>9.1</td></tr><tr><td>Σ(L)</td><td>14.9</td><td>11.3</td><td>9.3</td><td>9.8</td><td>5.3</td><td>10.8</td><td>9.6</td></tr></table>	Factor	Carbon	hormones	Vitamin	Mineral	Nitrogen	Dummy1	Dummy2	Σ(H)	4.9	24.5	6.7	9.3	9.7	13	9.1	Σ(L)	14.9	11.3	9.3	9.8	5.3	10.8	9.6	CO-3	1 5
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5.	a.	Design the sterilization time for an industrial scale batch medium sterilization process.	CO-2	1 5																								
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6.	a.	Air is sterilized through a depth filter and is sent at an flow rate of 17 m ³ /min for an fermentation process for 460x10 ³ min with an linear velocity of 0.15m/min. the value of the rate constant is 1.54 m ⁻¹ .Calculate i) Initial number of microorganism present in air ii) Radius of the filter iii) Length of the filter iv) Cross sectional area of filter	CO-2	1 5																								
7.	a.	Explain in detail the preservation techniques followed to store isolated industrially important microbes	CO-3	1 5																								
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8.	a.	What are the methods involved in the development of inoculum for Bakers Yeast Process	CO-3	1 5																								
<u>Compulsory:</u>																												
9.	a.	The experimental measurement of bakers yeast has shown that the carbon source is converted to biomass. For the following reaction the RQ is 0.44 C ₁₆ H ₃₄ + aO ₂ + bNH ₃ —————> cC _{4.4} H _{7.3} N _{0.86} O _{1.2} + d H ₂ O + e CO ₂ Calculate: a. Stoichiometric coefficients a,b,c,d and e. b. Degrees of reduction for substrate and biomass. c. Oxygen, Nitrogen and CO ₂ yield coefficient	CO-2	1 5																								

ALL THE BEST