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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_\_

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12BT218** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **Upstream Bioprocessing** | **Max. marks :** | **100** |

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| **Q. No.** | | **Questions** | | **Marks** |
| **PART-A(10X1=10 MARKS)** | | | | |
| 1. | | Fermentation is defined as \_\_\_\_\_\_\_\_\_\_\_\_. | | (1) |
| 2. | | Pathogenicity means\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | | (1) |
| 3. | | \_\_\_\_\_\_\_\_\_\_ is the method used to primarily screen the microbes which produce antibiotics. | | (1) |
| 4. | | Lyophilizaton is otherwise called as \_\_\_\_\_\_\_\_\_ | | (1) |
| 5. | | The organism which utilize energy from carbon source is called as \_\_\_\_\_\_ | | (1) |
| 6. | | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_is an example for non-nutritional media supplement.  \_\_\_\_\_\_\_\_\_\_\_ is used as the precursor for Penicillin V. | | (1) |
| 7. | | The no. of organism in unsterile broth is found to be 592 X 1012. Find Nabla factor. | | (1) |
| 8. | | The initial number of microorganism present in 2 liters of medium before sterilization is 1017 org/ml. Calculate nabla factor. | | (1) |
| 9. | | What is pitching? | | (1) |
| 10. | | \_\_\_\_\_\_\_\_% of inoculum is added to the culture volume. | | (1) |
| **PART B(5 X 3= 15 MARKS)** | | | | |
| 11. | | What are the five stages in development of fermentation industry? | | (3) |
| 12. | | Explain the method to preserve isolated actinomycetes. | | (3) |
| 13. | | What is Maillard Type Browning reaction? | | (3) |
| 14. | | 5litres of medium is taken for sterilization. The Del factor for heating and cooling is 1.12 and 1.3 respectively. The initial no. of microbes before sterilization is 2.7x1016 org/ml.Calculate Holding time if k is 2.5 min-1 | | (3) |
| 15. | | Draw the process flow diagram of inoculum development. | | (3) |
| **PART C(5 X 15= 75 MARKS)** | | | | |
| 16. | | Explain the basic configuration of a fermenter with a neat diagram. | | 15 |
| (OR) | | | | |
| 17. | | What are the five groups of commercially important fermentation process available? Explain in detail with examples. | | 15 |
| 18. | | Elaborate the primary screening methods followed in industries to isolate industrially important microbes. | | 15 |
| (OR) | | | | |
| 19. | | Discuss various preservation methods available to preserve the isolated industrially important microbes in detail. | | 15 |
| 20. | | Discuss in detail about the basic requirement for the production of industrial fermentation medium. | | 15 |
| (OR) | | | | |
| 21. | For the following data calculate the difference, average difference, mean square, experimental error and factors showing larger effect.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | **Factors** | **Carbon** | **Nitrogen** | **Vitamins** | **Minerals** | **Dummy-1** | **Precurssor** | **Dummy-2** | | **Σ(H)** | 3.9 | 14.5 | 9.5 | 9.1 | 9.4 | 14 | 9.2 | | **Σ(L)** | 14.9 | 4.3 | 9.3 | 9.7 | 9.4 | 4.8 | 9.6 | | | | 15 |
| 22. |  | | Design a batch sterilization process to carry out medium sterilization inorder to calculate sterilization time. | 15 |
| (OR) | | | | |
| 23. | | Air is sterilized through a depth filter and is sent at a flow rate of 14 m3/min for fermentation process for 45 min with a linear velocity of 0.17m/min and the value of the rate constant is 1.55 m-1 .Calculate   * + 1. Initial number of microorganism present in air     2. Radius of the filter     3. Length of the filter     4. Cross sectional area of filter. | | 15 |
| 24. | | Write a detailed note on the development of inoculum for bakers Yeast. | | 15 |
| (OR) | | | | |
| 25. | | What are the methods involved in the development of inoculum for production of vitamin B12. | | 15 |

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