

Enrollment No. _____



NAVRACHANA UNIVERSITY
a UGC recognized University

School: School of Science
Program/s: Master of Science
Year: 2nd **Semester:** III
Examination: End Semester Examination
Examination year: December - 2022

Course Code: BIO301 **Course Name:** Bioprocessing Technology
Date: 02/12/2022
Time: 08:30 to 10:30

Total Marks: 40
Total Pages: 2

Instructions:

- Write each answer on a new page
- Draw neat and well-labelled diagrams wherever required
- * COs=Course Outcome mapping. # BTL=Bloom's Taxonomy Level mapping

Q. No.	Details	Marks	CO*	BTL#
Q.1	<p>Choose the correct option</p> <p>1. Industrial production could be better performed using ____microbes. a. aerobic b. anaerobic c. facultative ananerobic d. all of the above</p> <p>2. The ____is achieved through____process. a. Higher, continuous b. higher, fed-batch c. lower,continuous d. None of the above</p> <p>3. ____was a precursor compound, that essentially triggered an era of industrial microbiology a. acetone b. acetylene c. isoprene d. None of the above</p> <p>4. Amount of ____is higher in____phase in an airlift fermentor a. air, downcommer b. air, riser c. media, riser d. None of the above</p> <p>5. The shear stress during fermentation process could be influenced by____ a. baffles b. spargers c. impellers d. All of the above</p> <p>6. Macrokinetic parameters during a large scale microbial production include a. temperature, pH, gas exchange b. optimizing media composition c. rheology of process d. None of the above</p>	12	CO1 CO2 CO3 CO4 CO5	BTL1 BTL2 BTL3

	<p>7. _____ is the limiting factors in bubble column reactor.</p> <p>a. aeration c. microbial physiology</p> <p>b. rheology d. all of the above</p> <p>8. design of _____ is important in reducing the size of air bubbles and distribution of media</p> <p>a. baffles c. spargers</p> <p>b. impellers d. none of the above</p> <p>9. Immobilization of enzyme can be achieved through_</p> <p>a. physical interaction only c. ionic interaction only</p> <p>b. covalent interaction only d. None of the above</p> <p>10. Immobilization using DEAE-cellulose is an example of_</p> <p>a. membrane entrapped immobilization c. microencapsulation immobilization</p> <p>b. surface immobilization d. All of the above</p> <p>11. nutrient agar can be used for_</p> <p>a. primary screening only c. both a and b</p> <p>b. secondary screening only d. none of the above</p> <p>12. Precipitation of citric acid with calcium leads to the formation of calcium citrate using_</p> <p>a. calcium phosphate c. calcium carbonate</p> <p>b. calcium chloride d. None of the above</p>			
Q.2	<p>Answer the following in short.</p> <p style="text-align: right;">Any six</p> <ol style="list-style-type: none"> 1. What is the importance of crystallization in the downstream processing of proteins? 2. What is the difference between fed-batch and continuous fermentation process? 3. What are the key features of solid state fermentation process? 4. Provide key steps involved in the process of secondary screening. 5. What are the key characteristics of disc centrifuge? 6. What is the difference between a bubble column reactor and fluidized bed reactor? 7. What is the importance of ball-mill among the other cell disruption methods? 8. What is the working principle of lyophilizer? 	12	<p>C01 C02 C03 C04 C05</p>	<p>BTL1 BTL2 BTL3</p>
Q.3	<p>Answer the following in detail.</p> <p style="text-align: right;">Any four</p> <ol style="list-style-type: none"> 1. Explain working principle of fluidized bed reactor with diagram. 2. Provide various methods for enzyme immobilization. 3. Provide important factors for designing a bioreactor. 4. Provide schematic diagram for the synthesis of glucose isomerase. 5. Explain in detail key methods for non-mechanical cell disruption methods. 	16	<p>C01 C02 C03 C04 C05</p>	<p>BTL1 BTL2 BTL3</p>

*****End of Question Paper*****