



**WEST BENGAL STATE UNIVERSITY**  
B.Sc. Honours 5th Semester Examination, 2020, held in 2021

**MCBACOR11T-MICROBIOLOGY (CC11)**

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.  
Candidates should answer in their own words and adhere to the word limit as practicable.  
All symbols are of usual significance.*

**Question No. 1 is Compulsory. Answer any *four* from the rest**

1. Answer any *four* questions from the following 2×4 = 8
- (a) Which, according to you, is the best method for preservation of industrial strains? Why?
- (b) What is 'one grain' of vinegar?
- (c) Illustrate with a specific example, how one can cut down on the cost of downstream processing just by changing the microbial strain for a particular product.
- (d) What are idiolites? Why they are so named?
- (e) What is denatured alcohol?
- (f) How is the temperature controlled in a bioreactor?
- (g) Justify the use of depth filters during downstream processing.
2. (a) A particular product requires the use of molasses as the basic carbon source for its production. What would happen if one wants to use whey instead of molasses? Discuss all possibilities and drawbacks, if any. 4
- (b) What are the advantages of *Zymomonas Mobilis* over *Saccharomyces cerevisiae* in ethanol production? 3
- (c) Why absolute alcohol cannot be obtained by fractional distillation? 1
3. (a) What could be the basic difference between media that is used to build up inoculum and media used for production of an industrially important product (production media)? 2
- (b) Discuss the two most critical parameters to be considered to run a successful solid-state fermentation. 2+2
- (c) Explain the agitation system used in a stirred tank fermenter. 2
4. (a) Name two sources of industrially important microbes. Why are some microbes labelled as "industrially important"? 2+1

- (b) Write a brief account on Airlift bioreactor. 2
- (c) How will you screen the microorganisms producing the following products? 1.5+1.5  
(i) Antibiotics (ii) Growth factors
5. (a) What are pneumatic bioreactors? Give two examples and two advantages of pneumatic bioreactors. 2+2+2
- (b) Differentiate between static filtration and cross flow filtration. 2
6. (a) How is TCA cycle regulated for enhanced production of citric acid? Name the microbial strain used for citric acid production. 3+1
- (b) What do you mean by scale up and scale down process? 2
- (c) Name two cryoprotectants used in freezing with liquid nitrogen (-196°C). What is its significance? 1+1
7. (a) Explain the carrier-binding mode for immobilization of enzyme. 3
- (b) State the advantages of using immobilized enzymes for industrial production. 2
- (c) What chemical changes occur during fermentation process of penicillin? 3
8. (a) What is the need for production of ethanol by biological means? 1
- (b) What is the role of oil in oil overlay method of culture preservation? 1
- (c) Write a brief note on HET. 2
- (d) What are the undesirable effects of foam in industrial process? What properties are required for ideal antifoam agents? 2+2

**N.B. :** *Students have to complete submission of their Answer Scripts through E-mail / Whatsapp to their own respective colleges on the same day / date of examination within 1 hour after end of exam. University / College authorities will not be held responsible for wrong submission (at in proper address). Students are strongly advised not to submit multiple copies of the same answer script.*

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