SEAT NO._____ No. of printed pages: **03**

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SARDAR PATEL UNIVERSITY

B.Sc. SEMESTER V EXAMINATION, December 2020

Thursday, 31-12- 2020

02:00 P.M. to 04.00 P.M.

SUBJECT: **MICROBIOLOGY US05CMIC06**

Fermentation Technology Total Marks: 70

Q-1 **Answer all Multiple Choice Questions by Choosing the Most Appropriate One. (10)**

1) Industrial production of mushrooms falls under_____range of fermentation.

a) Microbial biomass production b) Microbial enzyme production

c) Microbial transformations d) Recombinant DNA product from microbes

2) Which of the following steps is not a part of upstream processing?

a) Media formulation b) Inoculum development

c) Media sterilization d) Product formulation

3) Enzyme over-production may be achieved by_____in strain development.

a) Iso-enzyme production b) leaky cell-surfaces

c) Mutation in the gene coding for allosteric site of the enzyme d) all of these

4) A valine auxotroph of a bacterium would require _____amino acid in the growth medium in order to grow.

a) Lysine b) valine c) methionine d) phenyl alanine

5) Which of the following mutagen is a physical mutagen?

a) 5BU b) U.V. radiation c) E.M.S. d) hydroxyl amine

6) Spargers carry out _____ in a bioreactor.

a) improved vortex b) improved aeration c) antifoaming d) all of these

7) Which of the following organisms is used to check efficiency of sterilization?

a) B. *thuringiensis* *b) B. stearothermophilus* c) *B.subtilis* *d) B. cereus*

8) Modern technology provides computer automated control of _____among control parameters in fermentors.

a) Temperature b) pH c) both, a) and b) d) none of these

9) Which of the following is used for S.S.F.?

a) STR b) Air- lift fermentor c) Tray fermenter d) none of these.

10) Tween80 is used for controlling _____ during fermentation.

a) Ph b) DO c) temperature d) foam

Q-2 (a) Fill in all the blanks :(one mark each, total 4)

1. _____ are used as a source material for secondary screening. (Isolates from primary screening/ Soil samples)
2. Secondary metabolites are produced during _____ phase of microbial growth cycle. (stationary / logarithmic growth)
3. _____ fermentor does not have a device for agitation in an aerobic fermentation. (STR / Airlift)
4. _____ sterilization of media takes longer time in fermentation. (Batch/ continuous)

(b) Write T for the true statement and F for the false. Mention the question number carefully as given below: (one mark each, total 4)

1. Insulin production is an example of r-DNA product in fermentation technology.
2. Parasexual cycle is reported among bacteria.
3. Fed batch fermentation derives benefits of both, batch and continuous fermentation.

4. Oxygen limiting condition is often created if mass transfer of oxygen is not monitored efficiently in liquid media with higher density when fermentation is highly aerobic.

Q-3 Answer any ten (10) questions in brief. (02 marks each, total 20)

1. What is downstream processing?
2. Give two examples of primary metabolites produced in fermentation technology.
3. Explain the use of protoplast fusion in strain improvement.
4. Write four most desirable properties of a large scale producer microbe in industries.
5. Draw continuous fermentation mode.
6. What is the role of inducers? Give one example.
7. Write four important principles of inoculum development.
8. Enlist major features of continuous sterilization.
9. What is scale down?
10. Name any four types of fermentors.
11. Enlist types of chemical mutagens used for strain improvement.
12. How incoming air is sterilized during fermentation?

Q-4 ANSWERS ANY 4 QUESTIONS OF THE QUESTIONS GIVEN BELOW.

(8 marks each, total 32)

1. Define 'primary screening'. Write significance of secondary screening
2. Explain enzyme production as a range of fermentation processes.
3. Write a note on parasexual life cycle for strain improvement.
4. Describe mutagenesis by U.V.radiations for strain improvement.
5. Write a note on spargers and impellers.
6. Describe the structure and function of STR.
7. Explain scale up and its importance.
8. Describe mass transfer of oxygen and Kla.

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