

2021

MICROBIOLOGY — HONOURS

Paper : CC-12

(Industrial Microbiology)

Full Marks : 50

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

Answer **question no. 1** and **any three** questions from the rest.

1. Answer **any ten** questions : 2×10
- (a) How can foaming be detrimental to a fermentation process?
 - (b) What is the difference between a chemical process and bioprocess?
 - (c) What are the characteristics of an Industrial strain? Mention any four.
 - (d) State the differences between solid state fermentation and submerged fermentation.
 - (e) Define Fed batch fermentation. What is its application?
 - (f) What kind of matrices can be used for enzyme immobilization?
 - (g) “Lyophilization can be used for long term preservation of microorganisms”. — Justify.
 - (h) Name a microbial strain which gives high yield of neutral protease. Mention one use of the enzyme.
 - (i) What are the disadvantages of periodic transfer of microorganisms for preservation purpose?
 - (j) How media sterilization is done in industrial scale?
 - (k) Why some microorganisms are called industrial microorganisms not all?
 - (l) What is crowded plate technique?
 - (m) Why chelators are important for some industrially important media?
 - (n) What are the role of precursors in Penicillin production?
2. (a) Discuss the advantages and disadvantages of solid state fermentation.
- (b) Name one metabolite which is produced from SSF. Also mention its producing organism and the media used.
- (c) State the functions of – (i) Baffles (ii) Sparger.
- (d) Give a brief account of Black Strap molasses. 2½+2½+3+2

Please Turn Over

3. (a) What is primary screening? What are the most important primary screening techniques?
(b) What are cryoprotectants? Mention two names.
(c) What is strain improvement? What are the different methods used for strain improvement?
(1+3)+2+(1+3)
4. (a) Describe in brief the overall process of wine production.
(b) What is sparkling wine?
(c) Name the microorganisms used in large scale production of citric acid. Describe in brief the overall process of citric acid production.
5+1+(1+3)
5. (a) What is Enzyme immobilizaion? How is Glucose isomerase immobilized industrially?
(b) What are the important characteristics that the matrice/support used in Enzyme immobilization should possess? Give any two examples of matrices/support used.
(c) Mention two applications of immobilized enzymes.
(d) Name the microorganism used in large scale production of Ethanol. (1+3)+(2+1)+2+1
6. Write short notes on (*any four*) : 2½×4
(a) Air lift fermenter
(b) Heat transfer in SSF
(c) Corn-steep liquor
(d) Surface fermentation
(e) Type I & Type III fermentation
(f) Spray-drying.
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