V(5th Sm.)-Microbiology-H/CC-12/CBCS

# 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.  $2\frac{1}{2}+2\frac{1}{2}+3+2$

**Please Turn Over** 

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3. (a) What is primary screening? What are the most important primary screening techniques?

(2)

- (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 immobilization? 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

 $2^{1/2} \times 4$ 

- 6. Write short notes on (any four) :
  - (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.