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

2020

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 :

(a) What is microbial biosensor?

- (b) What is the difference between penicillins and semisynthetic penicillins?
- (c) Describe the importance of yeast in industries.
- (d) What is cryopreservation?
- (e) Why do we use a seed culture?
- (f) State the characteristic features of solid state fermentation.
- (g) How is air sterilized in a fermentation industry?
- (h) What are the advantages and limitations of continuous fermentation?
- (i) Why is strain improvement essential in biotechnology?
- (j) Why do you need to add antifoaming agent specifically in protein containing medium?
- (k) What are the criteria for selecting microbial strains for industrial fermentation?
- (l) Why corn steep liquor is preferred substrate for penicillin fermentation?
- (m) What are the functions of impeller (agitator) in a fermenter?
- (n) Define downstream processing.

2. (a) What are the chemical and physical methods used for cell-disruption?

- (b) Give one example of application of glucose isomerase in industry.
- (c) Write down two advantages and two disadvantages of immobilized enzymes.
- (d) Define microbial bioconversion. Explain the importance of microbial reaction over chemical reactions.

3+1+3+(1+2)

2×10

Please Turn Over

(2)

- **3.** (a) How would you preserve the following industrial cultures?
 - (i) Non-sporulating fungi
 - (ii) Yeast
 - (iii) Protozoa.
 - (b) What do you mean by still wine?
 - (c) Discuss about the microbial deterioration and spoilage of wine.
 - (d) Name two microorganisms for each lipase and protease production.
 - (e) Write down the fermentation condition of α -amylase production. $(1 \times 3)+1+2+2+2$
- 4. (a) Name the microorganisms used for large scale production of— 1×4
 - (i) Glutamic acid
 - (ii) Citric acid
 - (iii) Vit B₁₂
 - (iv) Penicillin.

(b)	How do you improve the penicillin-producing strain?	3
(c)	How is Vit B ₁₂ assayed?	3

- **5.** (a) What are the basic requirements for industrial production of ethanol? What are the byproducts formed during ethanol production?
 - (b) Discuss the difference between Bubble Column and Airlift Bioreactors with respect to (i) overall design (ii) specific purpose of use. (3+2)+(2¹/₂×2)
- 6. Write short notes on (any four) :
 - (a) Scale up
 - (b) Lyophilization
 - (c) Idiophase and Trophophase
 - (d) Cheap substrates for bioethanol production
 - (e) Techniques of enzyme immobilization
 - (f) Chemostat.

21/2×4