

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 : 2×10
- (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)

Please Turn Over

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. (1×3)+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 B₁₂ 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)+(2½×2)
6. Write short notes on (*any four*) : 2½×4
- (a) Scale up
 - (b) Lyophilization
 - (c) Idiophase and Trophophase
 - (d) Cheap substrates for bioethanol production
 - (e) Techniques of enzyme immobilization
 - (f) Chemostat.
-