

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH 2012

(CCSS)

Microbiology – Core Course

MB 6B 17 – INDUSTRIAL MICROBIOLOGY

Time : Three Hours

Maximum : 30 Weightage

Section A*Answer all **twelve** questions.*

1. The best medium for the industrial production of Penicillin is :
(a) Nutrient agar. (b) Corn steep liquor.
(c) Sulfite waste liquor. (d) Whey.
2. Vinegar fermentation involves :
(a) Yeasts only.
(b) Yeasts with lactic bacteria.
(c) Yeasts with acetic acid bacteria.
(d) Yeasts with butyric acid bacteria.
3. _____ is a downstream process.
(a) Media sterilization. (b) Production of seed.
(c) Cell immobilization. (d) Cell disruption.
4. *Aspergillus niger* is used generally for the production of :
(a) Ethanol. (b) Penicillin.
(c) Citric acid. (d) Lactic acid.
5. SCP from yeast is produced by :
(a) *Spirulina maxima*. (b) *Candida utilis*.
(c) *Saccharomyces cerevisiae*. (d) (b) and (c)
(e) All of them.
6. _____ is added as a precursor into the fermentation medium of Vitamin **B₁₂**.
(a) Magnesium chloride. (b) Magnesium sulphate.
(c) Cobalt sulphate. (d) Cobalt chloride.

Turn over

Fill in the blanks :

7. _____ is the starch hydrolyzing enzyme,
8. _____ is the most common methods of sterilization of air in aerobic fermentation process.
9. In lactic acid fermentation lactic acid downstream process starts with the addition of _____ which result in the production of salt lactate.
10. To prepare absolute alcohol from the 95% ethanol 5% water is removed by forming an _____ mixture of benzene, water an ethanol which then is distilled with increasing temperature increments.
11. To avoid strain _____ industrial strains are usually preserved by deep freezing or lyophilization.
12. CSL is used as the best source of _____ in fermentation media.

(12 x $\frac{1}{4}$ = 3 weightage)

Section B

Answer all.

Comment on :

13. Heat shocking.
14. Sparger.
15. Stillage.
16. Microbial consortia.
17. Fed batch fermentor.
18. Azotobacter.
19. Fixed-dome plant with a hemisphere digester (Deenbandhu model).
20. Cry gene.
21. Acetater.

(9 x 1 = 9 weightage)

Section C

*Answer any **five** out of seven.*

22. Define screening of industrially important micro-organisms. Why is it important ?
23. What is meant by scaling up? Why is essential for industrial fermentation process?
24. List the important methods used in stain improvement of industrial strains.
25. Outline the precautions taken in the inoculums production for Acetone-Butanol fermentation by *Clostridium acetobutylicum*.
26. Outline the development of Genetically Modified Organism for Rennin production.

27. Differentiate between batch sterilization and continuous sterilization.
28. Outline the fermentation of idli batter.
29. Comment on the concept of value addition of agriculture products.
30. *Lactobacillus delbrueckii* is an industrially important micro-organism. Comment.
(5 x 2 = 10 weightage)

Section D

Answer any **two** questions.

31. Discuss the steps of downstream process in the recovery of Penicillin and purification up to the purity of IP grade (Pharmacopeia grade).
32. What is a Bio pesticide? Discuss the properties of *B. thuringiensis* to make it a commercially important bio pesticide.
33. Differentiate between the fermentation process of alcohol production and biomass production of yeast.

(2 x 4 = 8 weightage)