

SIXTH SEMESTER B.Sc. DEGREE EXAMINATION, MARCH 2013

(CCSS)

Microbiology

MB 6B 17—INDUSTRIAL MICROBIOLOGY

Time : Three Hours

Maximum : 30 Weightage

Section A*Answer all twelve questions.*

1. Penicillin produced by *Penicillium chrysogenum* is an example of a :
 - (a) Primary metabolite.
 - (b) Metabolic waste.
 - (c) Secondary metabolite.
 - (d) Metabolic by-product of another metabolic pathway.
2. Commercial process of Vinegar fermentation uses :
 - (a) Aldehyde solution as raw material from which acetic acid is generated.
 - (b) Wood shavings as raw material from which acetic acid is generated.
 - (c) Alcohol solution as raw material from which acetic acid is generated.
 - (d) Sugar solution as raw material from which acetic acid is generated.
3. The addition of antifoam to production fermentor
 - (a) Antifoam will reduce foam formation so that pH maintenance will be proper.
 - (b) Antifoam will reduce foam formation so that temperature can be better controlled.
 - (c) Antifoam will reduce foam formation so that, foam buildup in head space that can lead to contamination, will be avoided.
 - (d) Antifoam will reduce foam formation so that agitator can work properly.
4. Which of the following food additives is not produced by micro-organisms :—
 - (a) Amylase.
 - (b) Citric acid.
 - (c) Sodium nitrate.
 - (d) Glutamic acid.
5. _____ can be used as SCP.
 - (a) *Spirulina maxima*.
 - (b) *Pleurotus ostreatus*.
 - (c) *Agaricus bisporus*.
 - (d) *Azolla*.

Turn over

6. Species which produces a crystal protein used as a bio-insecticide :

- (a) *Bacillus subtilis*. (b) *Bacillus sphaericus*.
(c) *Bacillus anthracis*. (d) *Bacillus cereus*.

Fill in the blanks :

7. 'Must' is the media used for the fermentative production of _____
8. *Eremothecium ashbyii* and *Ashbya gossypii* are ascomycetes used for the fermentative production of _____ vitamin.
9. *Zymomonas mobilis* is a bacterium which can ferment sugar to produce _____
10. _____ is the milk coagulating enzyme used for the production of cheese.
11. Black strap molasses is a by-product of _____ industry which is used as carbon source in fermentation industry.
12. Lard oil mixed with octadecanol is used as _____ in penicillin fermentation.

(12 x ¼ = 3 weightage)

Section B

Answer all.

Comment on :

13. CSL.
14. Secondary screening.
15. Whey.
16. Steroid transformation.
17. Pilot plant (Fermentor).
18. Active dry yeast.
19. Oxygen transfer is more difficult to obtain in large scale fermentations.
20. α-Amylase.
21. Fluidised Bed Reactor.

(9 x 1 = 9 weightage)

Section C

Answer any 5 out of 7.

22. Define media formulation. Why by-products or waste products of other industries are used as media ingredients of fermentation industries ?
23. What is a Bio-pesticide ? List the properties of *B.thuringiensis* to make it a commercially important bio-pesticide.

24. What is meant by continuous sterilization ? What are the methods used for this ?
25. List any four types of fermentors and give a note on the significance of them.
26. Define Idiophase. Discuss its importance in the fermentative production of secondary metabolites.
27. Discuss briefly about the Bio-methane production. List different models of Biogas plants.
28. Briefly discuss about the importance of bio-fertilizers with a suitable example.

(5 x 2 = 10 weightage)

Section D

Answer any two.

29. What is meant by strain improvement? Discuss the general methods adopted for this ?
30. Discuss the fermentative production of Acetone and Butanol.
31. Compare and contrast the fermentative production of yogurt and cheese.

(2 x 4 = 8 weightage)