

**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  $\frac{1}{4}$  = 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.  $\alpha$ -Amylase.  
21. Fluidised Bead 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)