

FIFTH SEMESTER B.Sc. DEGREE EXAMINATION, OCTOBER 2012

(CCSS)

BT 5B 03—BIOPROCESS TECHNOLOGY

Maximum : 30 Weightage

Time : Three Hours

I. Objective Type Questions. Answer *all* questions :

1 Polio vaccine was discovered by :

- (a) Sanger. (b) Salk.
(c) Baltimore. (d) Todaro.

2 Under aerobic conditions, cellular yield coefficient is used to estimate :

- (a) Carbon requirements for biomass production.
(b) Nitrogen requirements for biomass production.
(c) Energy requirements for biomass production.
(d) All the above.

3 Which of the following is false about anaerobic waste water treatment processes ?

- (a) Less sensitive to upsets by toxicants.
(b) Produce less sludge than aerobic process.
(c) Slower than aerobic process.
(d) All the above.

4 Beet molasses :

- (a) is limiting in biotin for yeast production.
(b) is 70-75% sugar.
(c) best molasses ever.
(d) is hydrol.

5 Propellers produce :

- (a) axial flows. (b) radial flows.
(c) vertical flows. (d) Tangential flows.

6 *Pseudomonas* carry out denitrification under :

- (a) aerobic conditions. (b) anaerobic conditions.
(c) microaerophilic conditions. (d) All the above.

Turn over

7 X_{90} in the filter design is :

- (a) filter of 90 cms length which removes particles entering the filter.
- (b) filter with 90 μm pore size which filters air.
- (c) filter depth required to remove 90% of the particles entering the filter.
- (d) None of the above.

8 Gate valves are :

- (a) on/off valves.
- (b) coarse control valves.
- (c) precision control valves.
- (d) none of the above.

9 Malt is :

- (a) wheat grains heat treated after germination.
- (b) corn partially germinated and heat treated.
- (c) cassava treated with acid.
- (d) barley partially germinated and heat treated.

10 The addition of antifoams in an aerated bioreactor will decrease oxygen transfer rates because antifoams :

- (a) decrease bubble coalescence.
- (b) reduce surface tension of the liquid.
- (c) decrease bubble size.
- (d) increase in substrate availability.

11 In fermentor sterilization, the thermal death characteristics of this organism is used.

- (a) *Bacillus megaterium*.
- (b) *Bacillus macerans*.
- (c) *Bacillus stearothermophilus*.
- (d) *Coxiella burnetti*.

12 The Orleans process is used in the manufacture of :

- (a) Interferon.
- (b) Dextran.
- (c) Vinegar.
- (d) 2, 3-butanediol.

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

II. Short Answer type questions. Answer *all* nine questions :

- 13 Turbidostat.
- 14 Protoplast fusion.
- 15 Auxotrophic mutants.
- 16 Composting.

17 Biogas.

18 Anion exchanger.

19 Entrapment.

20 Secondary screening.

21 Impeller.

(9 x 1 = 9 weightage)

III. Short essay or paragraph questions. Answer any *five* questions :

22 What are the basic functions of a fermenter? Explain the CSTR.

23 What are the advantages of continuous sterilization over batch sterilization?

24 Write a note on cryopreservation.

25 Explain the production of rabies vaccine.

26 What are the industrial applications of amylases?

27 Write a note on the application of enzymes in the pharmaceutical industry.

28 Why should industrial organisms be genetically modified?

(5 x 2 = 10 weightage)

IV. Essay questions. Answer any *two* out of three :

29 How will you isolate screen and improve an industrial micro-organism for a desirable trait?

30 Discuss the various methods of enzymes immobilization, their applications and advantages offered by immobilization.

31 Discuss the role of animal cell culture in the production of interferons.

(2 x 4 = 8 weightage)