

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) Tedaro.

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)