DAA-003-001517 Seat No. _____

B. Sc. (Sem. V) (CBCS) Examination

April / May – 2015

Biotechnology

BT-501 : Bioprocess & Biochemical Engineering

Faculty Code : 003
Subject Code : 001517

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

Instructions: (1) All questions are compulsory.

(2) The right side figure indicates total marks of the question.

(3) Draw the figure wherever necessary.

(4) Multiple Choice Questions have to be answered in answer sheet only.

1 Multiple Choice Questions: **20**

(1) Chromatography is based on the

(a) Different rate of movement of the solute in the column.

(b) Separation of one solute from other constituents by being captured on the adsorbent.

(c) Different rate of movement of the solvent in the column.

(d) Any of the above.

(2) For a microbial population growing in a chemostat, the specific growth rate

(a) Cannot be determined.

(b) Is equal to the maximum specific growth rate of the culture.

(c) Can be determined from the dilution rate.

(d) Can be determined by plotting 1n [biomass] vs time and calculating the slope of the curve

(3) A _____ is composed of population of cell that at the same stage of their cell cycle.

(a) Chemostat (b) Turbidostat

(c) Continuous (d) Synchronous culture

(4) Which of the following substance when added to fermentation medium becomes directly incorporated into the desired product?

(a) Precursor (b) Chelator

(c) Inducer (d) All of the above

(5) Which of the following offer nitrogen in the fermentation media?

(a) Beet molasses (b) Soybean hydrolysate

(c) Cane molasses (d) All of the above

(6) Antibiotics and vaccines are

(a) High value low bulk products

(b) High bulk low value products

(c) Both (a) and (b)

(d) None of the above

(7) Antifoams destabilize the protein film by which mechanisms?

(a) Hydrophobic bridges between two surfaces

(b) Displacement of the absorbed protein

(c) Both (a) and (b)

(d) None of the above

(8) Chelators used in the fermentation medium include _____.

(a) EDTA (b) Polyphosphates

(c) Citric acid (d) All of the above

(9) Sodium bisulphite is used as _____ in the glycerol production by yeast.

(a) Precursor (b) Inducer

(c) Buffer (d) Inhibitor

(10) Which of the following is an example of antifoam agent

(a) Silicones (b) Corn oil

(c) Soybean oil (d) All of these

(11) L lysine is produced from

(a) Corynebacterium glutamicum

(b) Aspergillus sps.

(c) Mycobacterium sps.

(d) None of these

(12) Primary products of metabolism are produced during

(a) Lag phase (b) Log phase

(c) Stationary phase (d) None of the above

(13) The by-product generated during streptomycin fermentation is,

(a) Vitamin A (b) Vitamin B_{12}

(c) Vitamin C (d) Vitamin D

(14) Supercritical fluid means

(a) Remain fluid above critical temperature and pressure

(b) Remain Fluid below critical temperature and pressure

(c) Remain gas above critical temperature and pressure

(d) Remain gas below critical temperature and pressure

(15) The fungus used in the industrial production of citric acid:

(a) Rhizopus oryzae (b) Fusarium moniliformae

(c) Rhizopus nigricans (d) Aspergillus nigricans

(16) Which assay technique is more appropriate for detecting product?

(a) Physical and chemical assay

(b) Biological assay

(c) Chromatographic assay

(d) Combination of more than one assay technique

(17) The final electron acceptor in lactic acid fermentation is:

(a) Pyruvate (b) NAD^+

(c) O_2 (d) ATP

(18) Which of the following can be application of fermentation?

(a) Tanning of leather (b) Curing of tea

(c) Production of wine (d) All of above

(19) Secondary metabolites are

(a) Products that require additional processing before they can be packaged.

(b) Essential to microbe function.

(c) By-products of metabolism that are not important to microbe function.

(d) Harvested during the exponential phase of growth.

(20) The method in which the cells are frozen dehydrated is called

(a) Dessication (b) Lypophilization

(c) Disinfection (d) Pasteurization

2 (A) Write **any three**: **6**

(1) Define: Fermentation.

(2) Role of filtration in downstream process.

(3) Define: Sterilization and name any two methods used in media sterilization.

(4) Describe: Distillation.

(5) Briefly describe Aeration.

(6) Differences between inoculums media and production media.

(B) Write **any three**: **9**

(1) Heat control in fermentation process.

(2) Write a brief note on the importance of aeration and agitation.

(3) Explain non mechanical methods used for disruption of cell.

(4) Application of recombinant DNA technique in strain improvement.

(5) Explain in detail: Flocculation and Floatation.

(6) What is starter culture? Describe its importance.

(C) Write **any two**: **10**

(1) Write a detail note on aseptic operation and containment.

(2) Explain types of Bioreactors.

(3) Vitamin B12 fermentation.

(4) Media optimization.

(5) Write a note on Fermentation Economics.

3 (A) Write **any three**: **6**

(1) Write a note on single cell protein.

(2) Define primary screening and enlist methods used in primary screening.

(3) Explain oxygen transfer rate.

(4) Explain the importance of starter culture.

(5) Chemostate and turbidostate in fermentation technology.

(6) Describe lyophilization in detail.

(B) Write **any three**: **9**

(1) Solid state fermentation.

(2) What is secondary screening? Explain in detail.

(3) Significance of inducer and inhibitor in fermentation media..

(4) Define head space and give its importance.

(5) Write a note of batch fermentation process.

(6) Airlift fermentor.

(C) Write **any two**: **10**

(1) Write a detail note on growth kinetic for batch culture.

(2) Explain role of automation in fermentation technology.

(3) Write a note on bioassay and its importance.

(4) Penicillin fermentation.

(5) Write a note on raw materials used in fermentation media.
