

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2022
(Fifth Semester)

Branch – BIOTECHNOLOGY

DISCIPLINE SPECIFIC ELECTIVE – I
INDUSTRIAL & MICROBIAL TECHNOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 1 = 10)

1. Considering the fermentation at the industrial level, the microorganism *Bacillus* is used to form
(i) ethanol (ii) Formic acid
(iii) Acrylic acid (iv) Glycerol
2. An air-lift fermenter uses _____.
(i) An impeller for mixing (ii) Air bubbles for mixing the contents
(iii) Differential density for mixing purpose (iv) A sparger for mixing the contents
3. Soy meal, peptone and tryptone are used as the source of _____.
(i) Carbon (ii) Carbon & Nitrogen
(iii) Nitrogen (iv) Mineral
4. Batch sterilization cycle time consists of
(i) Two phases (ii) Three phases
(iii) Four phases (iv) Five phases
5. A spray dryer works on the principle of
(i) Contact drying (ii) Sublimation
(iii) Lyophilization (iv) Adiabatic drying
6. In downstream processing, which of the following is used for purifying antibodies
(i) Anion exchange chromatography (ii) Cation exchange chromatography
(iii) Affinity chromatography (iv) Size exclusion chromatography
7. The phenomenon of production of ethanol by yeast cells under high concentration of glucose rather than producing biomass by TCA cycle is described as
(i) Warburg effect (ii) Simpson's effect
(iii) Crabtree effect (iv) Olivosky's effect
8. Marmite, an important commercial product is a _____.
(i) Fermentation main product (ii) Fermentation by-product
(iii) Partially fermented sugar (iv) Completely fermented sugar
9. Preservatives are commonly used to prevent bacterial spoilage and oxidation of wine. What is an example of such a preservative?
(i) Sulphur Dioxide (ii) Potassium Dioxide
(iii) Hydrogen Dioxide (iv) Calcium Dioxide
10. By using the single-cell protein, the amount of protein that can be produced by algae grown in ponds (per acre) is
(i) 20 tons (ii) 30 tons (iii) 40 tons (iv) 50 tons

Cont...

SECTION - B (25 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 5 = 25)

11. a Compare and contrast air lift and tower fermentor.
OR
b Write about utilization of high throughput techniques in strain improvement.
12. a Write a note on the use of by-products as substrate for bioprocess development.
OR
b Compare and contrast the solid against submerged fermentation.
13. a Write short notes on 'rpm', 'rcf' and 'g' pertaining to centrifugation and its conversion formula during downstream processing.
OR
b Write the procedure for assuring quality of a product – Industrial perspective.
14. a Describe the industrial production process using *Acetobacter spp.*
OR
b Describe the production of Vitamin C with relevant flowchart.
15. a Write short notes on baking industry and products produced.
OR
b Describe the production of growth factors using yeast cells.

SECTION -C (40 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 8 = 40)

16. a Draw and describe the Fermentor with logistics components.
OR
b Write the process of isolation, preservation and maintenance of microorganisms in industry
17. a Write the media composition for ethanol production by solid state fermentation with illustration
OR
b Sketch your views on the thermal death kinetics of microbes involved in i) primary metabolite production and ii) secondary metabolite production with examples
18. a Sketch the following techniques and its uses industrially i) Cell disruption ii) Precipitation iii) Centrifugation iv) Filtration v) Chromatography
OR
b Write about upstream and downstream processing wrt liquid culture inoculated with *Saccharomyces cerevisiae* for production of antibodies
19. a Describe the process of production of any two enzymes
OR
b Describe the process of production of any two antibiotics
20. a Describe the process of production of dairy products
OR
b How will you formulate the production of mushrooms in large scale? Add a note on packaging and marketing

Z-Z-Z

END