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SEAT No._____

[83/A-50]

SARDAR PATEL UNIVERSITY

M. Sc. Integrated Biotechnology (IGBT) 6th Semester
Theory Exam – April 2018
PS06CIGB03 – Industrial Microbiology (NEW)
13th April 2018 (Friday), 2:00 pm to 5:00 pm

Maximum Marks: 70

Note: (1) All the Questions are compulsory. (2) Figures on the right indicate marks.

Q.1. Choose the correct option **1x8 = 8**

(i) Which of the screening technique used for the isolation of microorganisms producing growth factors?
[A] Enrichment technique [B] Auxanography
[C] Crowded plate technique [D] Use of indicator dyes.

(ii) _____ are some chemicals when added to certain fermentations are directly incorporated into desired product.
[A] Buffers [B] Inducers
[C] Precursors [D] Inhibitors

(iii) Fermentative production of amylase enzyme on industrial scale is carried out using_____.
[A] Bacteria [B] Fungi
[C] Both A & B [D] None of these

(iv) The most widely used chemical for protoplast fusion, as fusogen, is_____.
[A] Manitol [B] phenylglycine
[C] Sorbitol [D] Poly ethylene glycol

(v) K_La determination by dynamic methods of gassing out procedure is
[A] increasing the supply of air to the fermenter
[B] stopping the supply of air to the fermenter
[C] decreasing the supply of air to the fermenter
[D] none of these

(vi) During sterilization the Maillard-type browning reaction which results in discoloration of the medium as well as loss of nutrient quality caused by
[A] the reaction of carbonyl groups, usually from non-reducing sugars, with the amino groups of amino acids and proteins
[B] the reaction of carbonyl groups, usually from reducing sugars, with the amino groups of amino acids and proteins
[C] the reaction of carbonyl groups, usually from proteins, with the amino groups of proteins
[D] the reaction of carbonyl groups, usually from non-reducing sugars, with the amino groups of nucleotides

(vii) Which of the following device regulate and control flow of liquid and gas?
[A] Inlet Air Filter [B] Valves
[C] Exhaust point [D] Exhaust Air Filter

P.T.O.

(viii) Identify the correct sequence during the industrial production of product.

[A] Inoculation, screening, fermentation, downstream processing, removal of waste

[B] Screening, Inoculation, fermentation, downstream processing, removal of waste

[C] Fermentation, screening, inoculation, removal of waste, downstream processing

[D] Fermentation, inoculation, inoculation, removal of waste, downstream processing

Q.2. Attempt any Seven of the following **2x7 = 14**

(a) Draw neatly labeled diagram of fermenter.

(b) Write a role of pH indicator stains in media for screening with examples.

(c) Define partition coefficient.

(d) Define absolute filters and depth filters.

(e) Define the terms: Solid-state fermentation and submerged fermentation.

(f) Write the steps of oxygen transfer from air bubble to the cell.

(g) Enlist the applications of citric acid.

(h) Write a note on use of precursors as a raw material in fermentation medium.

(i) Define Screening and Enlist different techniques of primary screening.

Q. 3. [A] Discuss in detail the technique used for primary screening of Antibiotic producing organisms. **[06]**

[B] Discuss strain improvement with suitable examples for the isolation of induced mutant producing improved yield of primary metabolites. **[06]**

OR

Q. 3. [B] Enlist various methods of preservation of industrially important microorganisms. Explain any one method in detail. **[06]**

Q. 4. [A] Explain in detail batch sterilization of media. **[06]**

[B] Discuss in detail various nitrogen sources used in fermentation medium and Factors influencing the choice of nitrogen source. **[06]**

OR

Q. 4. [B] Discuss in detail various carbon sources used in fermentation medium and Factors influencing the choice of carbon source **[06]**

Q. 5. [A] Enlist different types of impeller and sparger and explain them in detail. **[06]**

[B] Write a note on scale up. **[06]**

OR

Q. 5. [B] What is K_La? Discuss Sulphite oxidation technique for determination of K_La. **[06]**

Q. 6. [A] Explain in detail the fermentative production of amylase. **[06]**

[B] Discuss in detail the Ion exchange chromatography for product recovery. **[06]**

OR

Q. 6. [B] Explain in detail citric acid production by surface culture? **[06]**

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