

SEAT No. _____

No. of Printed Pages : 3

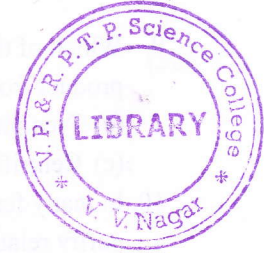
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SARDAR PATEL UNIVERSITY

B.Sc. Semester- V Examination: December 2020

MICROBIOLOGY

US05CMIC24: Fermentation Technology-I



Time: 02 Hours

2:00 to 4:00 pm

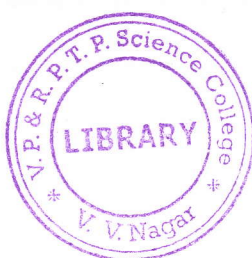
Total marks: (70)

Instructions: (1) It is compulsory to attempt all four questions.

(2) Marks of each question are indicated on the right.

Q. 1 Answer the following multiple choice questions: (10)

- Who defined fermentation as any anaerobic process through which microorganisms obtain energy for growth in absence of O_2 .
(a) Edward Jenner (b) Louis Pasteur
(c) Robert Koch (d) Paul Ehrlich
- Secondary metabolites production is very common in _____.
(a) The filamentous bacteria (b) Fungi
(c) The spore forming bacteria (d) All of these
- Which technique is largely used for primary screening of growth factors producing microorganisms?
(a) Auxanography technique (b) Crowded plate technique
(c) Serial dilution technique (d) None of these all
- Sulfite waste liquors from coniferous trees have a total sugar content of _____.
(a) 5 - 10 % (b) 20 - 30 %
(c) 2 - 3 % (d) 15%
- Sodium bisulphite is used as _____ in glycerol production.
(a) Inducer (b) Inhibitor
(c) Precursor (d) Source of carbon
- _____ is a measure of the fractional reduction in viable organism count produced by a certain heat and time regime.
(a) Del factor (b) Death factor
(c) Death coefficient (d) Quality criterion
- Which of the following is an example of most commonly used fermenter?
(a) Tower fermenter (b) Airlift fermenter
(c) Loop Reactor (d) Stirred Tank bioreactor
- _____ is used as a measure of the aeration capacity of a fermenter.
(a) $C^* - CL$ (b) KLa
(c) KL (d) DOT



9. Which of the following process is useful in one step enrichment and concentration of product from fermentation broth?
- (a) Precipitation (b) Foam separation
(c) Centrifugation (d) None of these all
10. In many fermentation processes, _____ techniques are used to isolate and purify relatively low concentrations of metabolic products.
- (a) Centrifugation (b) Solvent extraction
(c) Chromatography (d) Foam separation

Q. 2. Fill in the Blanks and True- False:

(08)

- _____ is used as a motor car fuel when blended with petroleum.
- _____ is used in the primary screening of organic acid producing microorganisms.
- _____ is a process by which metabolically active cell culture is produced for fermentation process.
- Deterioration of quality of a culture medium and high energy consumption are disadvantages of batch sterilization. (True or False)
- In sodium sulphite oxidation technique, the sulphite oxidation rate is equivalent to the oxygen-transfer rate. (True or False)
- In batch fermentation, non-productive phase is called _____.
- During filtration, the use of filter aids is not necessary to improve filtration rates. (True or False)
- In liquid-liquid extraction, if the value of K is very low than the extraction of product is done by _____.

Q. 3. Answer the following questions in very short: (Attempt any ten)

(20)

- Give four examples of industrial applications of enzymes.
- Explain the term biotransformation with suitable example.
- Define: Screening.
- Enlist most commonly used nitrogen sources in fermentation media.
- What are precursors? Give suitable example.
- Give any four examples of industrially important enzyme inducers.
- What is continuous fermentation?
- What are advantages of air lift fermenter?
- Enlist the factors affecting value of KLa.
- Enlist the main stages of Downstream Processing.
- Which agents are used in precipitation of the compound of interest?
- Draw diagram of a multi chamber centrifuge.

Q. 4. Answer the following long questions: (Attempt any four)

(32)

- (A) Discuss in detail characteristics of industrially important microorganisms.
- (B) Explain significance of secondary screening.
- (C) Discuss in detail about carbon sources used in fermentation media.
- (D) Describe continuous sterilization of fermentation media.
- (E) Draw neat diagram of a typical stirred tank fermenter, label it and give functions of each part in brief.
- (F) Describe mass transfer of oxygen and also discuss methods of its determination.
- (G) Discuss in detail separation of cells and solids by filtration.
- (H) Discuss the techniques used for the disruption of microbial cells.

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