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SARDAR PATEL UNIVERSITY  
EXTERNAL EXAMINATION,  
BSC, V SEMESTER  
TIME: 10:30am to 1:30 pm  
Subject/Course Code: US05CMIC 06  
Subject/Course Title: Fermentation Technology

Monday, 25<sup>th</sup> Nov, 2013

Total Marks: 70

Q.1 Multiple Choice Questions

(10)

1. Which of the following is the product of secondary metabolism?  
a. Amino acids      b. Nucleotides      c. Antibiotics      d. All of these
2. Interferon, insulin, human serum albumin etc are the product of \_\_\_\_\_ microorganisms.  
a. Auxotrophic      b. Autotrophic      c. Wild type      d. Genetically engineered
3. \_\_\_\_\_ metabolites are synthesized during idiophase.  
a. Primary      b. Secondary      c. Both (a) and (b)      d. None of above
4. Short wavelength UV rays damages DNA by causing \_\_\_\_\_.  
a. Cytosine-      b. Thymine-      c. Thymine-      d. All of the above.  
Cytosine dimers      Cytosine dimers      Thymine dimers
5. PEG is used to induce recombination in \_\_\_\_\_.  
a. Protoplast fusion      b. Sexual cycle      c. Parasexual cycle      d. None of the above
6. In Penicillin fermentation, Phenylacetic acid in the medium results in the production of \_\_\_\_\_.  
a. Penicillin-G      b. Penicillin-V      c. Penicillin-N      d. Penicillin-F
7. A fermenter, with internal or external riser, is an example of \_\_\_\_\_.  
a. CSTR      b. Air lift fermenter      c. Fluidized bed reactor      d. None of the above
8. Which of the following is a reactor for SSF?  
a. CSTR      b. Air-lift fermenter      c. Tray fermenters      d. None of the above
9. Which of the following is the most common method used for medium sterilization?  
a. Use of steam.      b. Use of chemicals      c. Use of radiation      d. None of the above.
10. Which organism is used to check the efficiency of sterilization.  
a. *Bacillus thuriengensis*      b. *Bacillus stearothermophilus*      c. *Bacillus subtilis*      d. *Bacillus megaterium*

**Q.2 Attempt any ten.**

**(20)**

1. Enlist the range of fermentation processes, giving one example of each.
2. Write on the ideal characteristics of industrially important microorganisms.
3. Draw a schematic representation of a typical fermentation process.
4. Explain the use of ionizing radiation in strain improvement.
5. Write on the substrates used as nitrogen source in fermentation medium.
6. Enlist the ideal characteristics of a fermentation medium.
7. Write on problems envisaged in SSF?
8. Write on the control of temperature during a fermentation process.
9. Draw a neat and labeled diagram of a typical fermenter with one multi bladed impellers.
10. Write on the advantages and disadvantages of continuous sterilization over batch sterilization.
11. Describe in brief on scale-up.
12. Describe the effect of the degree of agitation on  $K_L$ .

Q.5 Write a short note on:

- a. Ideal characteristics of a fermenter.
- b. Characteristics of SSF

(06)

(04)

OR

Q.5 Write a short note on:

- a. Spargers
- b. Air-lift fermenter.

(06)

(04)

Q.6 Write short note on:

- a. Sterilization of air
- b. Sampling

(06)

(04)

OR

Q.6 Write short note on:

- a. Continuous sterilization of fermentation medium.
- b. Scale-down of fermentation process

(06)

(04)

Q.3 Discuss the significance of secondary screening.

(10)

OR

Q.3 Write a detailed note on Primary screening of organic acid and antibiotic producers.

(10)

Q.4. Write Short Notes on:

- a. Mutagenesis through UV radiation.
- b. Mutagenesis with chemical agents.

(05)

(05)

OR

Q.4. Write Short Notes on:

- a. Isolation of auxotrophic mutants for primary metabolite.
- b. Isolation of auxotrophic mutants for secondary metabolite.

(05)

(05)

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