

Sardar Patel University, Vallabh Vidya Nagar

M.Sc: Environmental Science and Technology

I Semester

Course: Environmental Microbial Technology

Course no: PS01CEST02

Date: 3rd December, 2012

Time: 10.30 – 1.30 pm

Max.Marks: 70

N.B: i. Draw neat and labelled diagrams wherever necessary to score full marks.

ii. All questions are compulsory and carries equal marks.

Q1. Answer the following multiple choice questions

(8X1)

- a. One of the costliest enzymes available commercially, is
i. bacterial α -amylase ii. bacterial protease iii. bacterial lipase iv. none
- b) CO₂ sources as substrate used by the following organism/s
i. Brevibacterium ii) Methano monasmethanica iii) Candida lipolytica iv) none
- c) The following organism is good example for phosphate solubilise fertilizer
i. Anabaena ii. Rhizobium iii. Azatobacter iv. none
- d.) Betahydroxy butyric acid granules are observed in
i. Rhizobium ii. Rhizopus iii. Rhizomorph iv. i& ii
- e.) Raw materials used for the alcohol production is.....
i. Molasses, ii. Starch iii. Sulphite waste liquor iv. All of these
- f.) The strain of fungi used for the large scale production of penicillin is.....
i. *Penicillium chrysogenum* ii. *Saccharomyces cerevisiae* iii. *Penicillium notatum*
iv. *Streptomyces aureucus*
- g.) Citric acid is used as.....
i. Flavoring agent in food, ii. As an antioxidant iii. As preservative iv. All
- h.) Which byproducts are produced in biodiesel production?
i. Glycerin, ii. Methanol iii. Soap iv. All of above

Q2. Answer any Seven of the following

(7X2)

- i. Vermi-wash.
- ii. Economic importance of Enzymes in industries
- iii. Important organisms used in SCP
- iv. Carrier based inoculants
- v. Advantages of microbial enzymes than plant and animal.
- vi. Differentiate the continuous and batch process.
- vii. Differentiate the primary and secondary screening.
- viii. Explain the components parts of fermentation process.
- ix. Write definition and advantages of bioprocess technology.

Q3. A. Explain various methods used in enzyme isolation and extraction processes and add a note on its merits and demerits. (6)

B.i. Describe criteria used for sources of enzymes (3)

ii. Write a note on removal of nucleic acids and solids during enzyme purification. (3)

OR

B.i. Explain steps involved in SCP production and add a note on Spirulina protein production (3)

ii. Enumerate immobilization methods in brief. (3)

Q4. A. Explain isolation, nitrogen fixation mechanism, mass cultivation methods of Rhizobium fertilizers (6)

B.i. Explain the structure of Endomycorrhiza with diagram (3)

ii. Write a note on isolation of BGA bio-fertilizers (3)

OR

B.i. Give a brief account on vermi-composting technology with diagram (3)

ii. Write a note on importance of mushrooms (3)

Q5. A. Summarize the applications, fermentation and recovery process of citric acid production. (6)

B.i. Describe advantages of anaerobic digestion in detail. (3)

ii. Mention the disadvantages of biodiesel with proper explanation. (3)

OR

B.i. Briefly describe the substrates which can be used in biogas production. (3)

ii. Draw process flow schematic diagram for biodiesel production and explain each step in detail. (3)

Q6. A. Describe the various carbon and nitrogen sources, minerals, growth factors and inhibitors which are commonly used in bioprocess technology. (6)

B.i. What is biodiesel? Write the transesterification reaction of biodiesel production. (3)

ii. Write a detailed note on biology of biogas production. (3)

OR

B.i. Write a brief note on microbial enzymes. (3)

ii. Explain the substrates, biochemistry and recovery process of penicillin production. (3)

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