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B. TECH
(SEM-V) THEORY EXAMINATION 2020-21
FERMENTATION BIOTECHNOLOGY

*Time: 3 Hours**Total Marks: 100***Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.****2 x 10 = 20**

Q no.	Question	Marks	CO
a.	What do you understand by fermentation?	2	CO1
b.	Enlist five fermentation products with the raw materials and microbes used in its production.	2	CO1
c.	What do you understand by inoculum? How is it developed?	2	CO2
d.	What are the advantages and limitations of using mycelial culture?	2	CO2
e.	Enlist the major components of media. Also define antifoam.	2	CO3
f.	What is aseptic operation and contamination?	2	CO3
g.	Define metabolism and types of reactions involved.	2	CO4
h.	Differentiate between primary and secondary metabolites.	2	CO4
i.	What are the advantages and disadvantages of microbial transformation?	2	CO5
j.	What is the difference between biomining and bioleaching?	2	CO5

SECTION B**2. Attempt any three of the following:**

Q no.	Question	Marks	CO
a.	Explain a generalized schematic representation of a typical fermentation process.	10	CO1
b.	Explain the kinetics of microbial growth.	10	CO2
c.	Explain the use of water as an important constituent for fermentation. Describe the use of buffers for media preparation in fermentation.	10	CO3
d.	Differentiate between feedback inhibition and feedback repression.	10	CO4
e.	Enlist the microbes used in enzymes production. Describe the industrial production process of amylase. Also enlist the uses of amylase.	10	CO5

SECTION C**3. Attempt any one part of the following:**

Q no.	Question	Marks	CO
a.	What are the different approaches for strain improvement? Explain.	10	CO1
b.	Describe the different methods used for culture preservation in industries. Also describe their effects.	10	CO1

4. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	What are the different phases of microbial growth in a batch culture? Explain its characteristics.	10	CO2
b.	What do you understand by fed batch culture? How is mass and energy balanced in this reactor? Derive the equations for biomass and product formation in fixed volume and continuous volume fed batch culture. Also write down the significance of dilution factor.	10	CO2



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5. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	Discuss the medium, filter and air sterilization processes of batch and continuous systems.	10	CO3
b.	What do you understand by sterilization? Describe the kinetics of sterilization in a batch process. What are the effects of heating on the survival of bacterial endospores population?	10	CO3

6. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	Write short note on- i. Overproduction of primary and secondary metabolites ii. Nutritional repression	10	CO4
b.	Write short note on- i. Carbon catabolite repression ii. Crabtree effect	10	CO4

7. Attempt any one part of the following:

Q no.	Question	Marks	CO
a.	What do you understand by biopharmaceutical? How its production is different from chemical synthesis of pharmaceutical products? Explain with example.	10	CO5
b.	Describe the process, parameters and materials used in industrial production of ethanol. Also enlist the byproducts of ethanol production and its uses.	10	CO5