



## GIET UNIVERSITY, GUNUPUR – 765022

Ph.D. (Second Semester) Examinations, November – 2023

### WPPEBTS2011 - Microbial Technology

(Biotechnology - SoS)

Time: 3 hrs

Maximum: 70 Marks

The figures in the right hand margin indicate marks.

**Answer ANY FIVE Questions**

**(14 x 5 = 70 Marks)**

	Marks
1.a. Write on microbial growth in both batch and continuous culture.	7
b. What is continuous culture? Write an essay on its types and importance?	7
2.a. Discuss the advanced methods for measurement of microbial diversity.	7
b. Discuss in details about synchronous and asynchronous culture	7
3.a. Write on production of ethanol in industry with its biochemistry.	7
b. Describe two important industrial enzyme production using microbes?	7
4.a. What is secondary metabolite of microorganisms? Discuss the process for synthesis and production of Penicillin.	7
b. Explain briefly about the industrial production of Glutamic Acid with its biochemistry.	7
5.a. Give in detail the process of bioleaching.	7
b. Write on production biopolymers and its use to remediate pollution.	7
6.a. What is Biopolymers? Explain the production of Xanthan gum and its use?	7
b. Explain in details about the basic steps of production of recombinant proteins.	7
7 a. Discuss about the different types of media used in industrial fermentation process.	7
b. Write down about the concept and process of solid state fermentations with its applications.	7
8 a. Write in details on three important microbial strains used in industry.	7
b. What is metabolic engineering? Describe one metabolic engineering technique for improvement of production of secondary metabolites.	7

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