

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**BSc DEGREE EXAMINATION MAY 2026
(Sixth Semester)**

Branch - **MICROBIOLOGY**

INDUSTRIAL MICROBIOLOGY

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer **ALL** questions

ALL questions carry **EQUAL** marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following is an example of submerged fermentation? (i) Mushroom Cultivation (ii) Composting (iii) Production of citric acid using <i>Aspergillus niger</i> (iv) Tempeh production	K1	CO1
	2	The crowded plate technique is mainly used for: (i) Preservation of cultures (ii) Primary screening of antibiotic producers (iii) Secondary screening (iv) Mutation induced	K2	CO1
2	3	The main purpose of agitation in a fermentor is to: (i) Sterilize the medium (ii) Increase pH (iii) Ensure proper mixing and oxygen transfer (iv) Remove foam	K1	CO2
	4	A membrane bioreactor primarily uses a membrane for: (i) Heating (ii) Mixing (iii) Cell separation (iv) Sterilization	K2	CO2
3	5	Molasses is commonly used in industrial fermentation as a source of: (i) Nitrogen (ii) Carbon (iii) Vitamin (iv) Oxygen	K1	CO3
	6	The most common method for sterilization of fermentation media is: (i) Filtration (ii) Radiation (iii) Steam under Pressure (iv) UV Treatment	K2	CO3
4	7	Intracellular products require which additional step before purification? (i) Sterilization (ii) Cell disruption (iii) Aeration (iv) Inoculation	K1	CO4
	8	High molecular weight products such as proteins are commonly purified by (i) Distillation (ii) Crystallization (iii) Precipitation (iv) Evaporation	K2	CO4
5	9	Penicillin is produced by: (i) <i>Streptomyces</i> (ii) <i>Penicillium chrysogenum</i> (iii) <i>Lactobacillus</i> (iv) <i>Clostridium</i>	K1	CO5
	10	Alcoholic fermentation in wine production is carried out by: (i) <i>Bacillus</i> (ii) <i>Saccharomyces cerevisiae</i> (iii) <i>Aspergillus</i> (iv) <i>Rhizopus</i>	K2	CO5

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SECTION - B (35 Marks)Answer **ALL** questions**ALL** questions carry **EQUAL** Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain on the various ranges of fermentation processes.	K2	CO1
		(OR)		
	11.b.	Define auxotrophic mutants and mention their importance.		
2	12.a.	With a neat illustration describe the basic design of a general fermentor.	K2	CO2
		(OR)		
	12.b.	Elaborate on the working principles of agitator and aeration system.		
3	13.a.	Differentiate between growth media and production media.	K3	CO3
		(OR)		
	13.b.	Outline on the inoculum development for bacterial fermentation.		
4	14.a.	Write short notes on physical methods of cell disruption.	K3	CO4
		(OR)		
	14.b.	Describe the working principle of a rotary drum filter.		
5	15.a.	Differentiate between Solid State Fermentation and Submerged Fermentation (SmF).	K3	CO5
		(OR)		
	15.b.	List out the advantages and industrial uses of immobilized enzymes.		

SECTION -C (30 Marks)Answer **ANY THREE** questions**ALL** questions carry **EQUAL** Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Describe methods of strain improvement in industrial microbiology.	K3	CO1
2	17	Sketch out a diagram explain the design and working principle of a tower fermenter.	K4	CO2
3	18	With a neat illustration, explain the mechanisms of stirring and mixing in fermenters.	K5	CO3
4	19	Illustrate on the liquid-liquid extraction of low molecular weight products.	K3	CO4
5	20	Describe industrial production of penicillin and cephalosporin.	K4	CO5