QP Code: RD18001051 Reg. No | | | | | | | | | | | AR 18

GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, December – 2020

(Fifth Semester)

BBTPE5041 – INDUSTRIAL MICROBIOLOGY AND ENZYME TECHNOLOGY

(Biotechnology)

Time: 2 hrs Maximum: 50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) (1 x 10 = 10 Marks)

Q.1. Answer ***ALL*** questions [CO#] [PO#]

a. During the stationary phase of the microbial cell growth, the net specific growth rate (μ) is — 1 1

(i)<0 (ii)> 0

(iii) = 0 (iv) None of the above

b. The Logistic cell growth model is — 1 1

(i) Directly proportional to substrate concentration (ii) Inversely proportional to substrate concentration

(iii) Independent of substrate concentration (iv) Dependent of product concentration

c. In a fed batch culture, substrate inhibition can be overcome by — 1 1

(i) Removal of waste material (ii) Addition of substrate at regular interval of time

(ii) Addition of substrate only in the beginning (iv) Removal of culture fluid

d. In which phase Penicillin is produced? — 2 1

(i) Lag phase (ii) Log phase

(iii) Exponential phase (iv) Stationary phase

e. Which of the following organisms is not used for the production of citric acid? — 2 1

(i) *Aspergillus wentii* (ii) *Bacillus licheniformis*

(iii) *Candida oleophila* (iv) *Saccharomyces cerevisiae*

f. Which of the following procedure has a great application in strain improvement? — 3 1

(i)rDNA Technology (ii)Conjugation

(iii)Transformation (iv) Transduction

g. Which of the following is not a physical method for selection of pure culture? — 3 1

(i) Heat treatment (ii) pH of the media

(iii) Cell size and motility (iv) Use of dilute media

h. Which of the following method can be used to determine the number of bacteria quantitatively? — 3 1

(i) Streak-plate (ii) Spread-plate

(iii) Pour plate (iv) Pour-plate and spread plate

i. Which of the following reaction is catalyzed by Lyase? — 4 1

(i) Formation of bonds (ii)Intra molecular rearrangement of bonds

(iii) Breaking of bonds (iv) Transfer of group from one molecule to another

j. A covalent bond between two atoms may be broken in different ways depending upon — 4 1

(i) Nature of the given organic compound (ii)Nature of attacking agent

(iii)Reaction condition (iv)All the above mentioned

PART – B: (Short Answer Questions) (2 x 5 = 10 Marks)

Q.2. Answer ***ALL*** questions		[CO#]	[PO#]
a.	Why specific growth rate / doubling time should be calculated at the log phase of the cell?	1	2
b.	Write any two important applications of citric acid in the industry.	2	1
c.	What are the nutritional requirements for the growth of Microorganism?	3	1
d.	List some industrially produced enzymes and their applications.	4	1
e.	What are the advantages and disadvantages of enzymes as commercial agents?	4	1

PART – C: (Long Answer Questions) (6 x 5 = 30 Marks)

Answer ***ANY FIVE*** questions		Marks	[CO#]	[PO#]
3.	Explain in detail about steps involved in the fermentation process.	(6)	1	1
4.	A plasmid-containing strain of *E. coli* is used to produce recombinant protein in a 250-1itre fermenter. The probability of plasmid loss per generation is 0.005. The specific growth rate of plasmid-free cells is 1.4 h^{-1} ; the specific growth-rate of plasmid-bearing cells is 1.2 h^{-1}. Estimate the fraction of plasmid-bearing cells after 18 h growth if the inoculum contains only cells with plasmid.	(6)	1	1
5.	Explain in detail about production of citric acid formation in the industry.	(6)	2	1
6.	Explain in detail about biosynthesis pathway and steps involved in Butanol production.	(6)	2	1
7.	Explain in detail about Davies' proposalsfor production of secondary metabolites through employing strain improvement.	(6)	3	1
8.	Explain in detail about steps involved in development of inoculumfor a Vitamin B12 Pilot Scale Fermentation Using Pseudomonas denitrificans	(6)	3	1
9.	With a suitable example explain in detail role of enzymes involved in carbon - carbon bond fission reactions.	(6)	4	1
10.	Elaborate in detail about various applications of enzymes in industry, analytical purpose and medical therapy.	(6)	4	1

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