Reg No.:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Third semester B.Tech examinations (S) September 2020

Course Code: BT203

Course Name: CONCEPTS IN BIOCHEMICAL ENGINEERING

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. Marks

1 a) With a neat diagram discuss the Monod kinetics in a batch culture explaining the various phases of growth. (8)

b) Evaluate the effect of various environmental factors on the growth rate of microorganisms. (7)

2 a) Draw a neat diagram of a plant cell and animal cell and label the cell organelles. (5)

b) What are the various polymeric chemicals in a cell? Explain their structure and functions with appropriate examples. (10)

3 a) Draw a flow chart to represent the hierarchy of cellular organisation. (7)

b) With a neat flow sheet explain the EMP pathway for glycolysis. (8)

PART B

Answer any two full questions, each carries 15 marks.

4 a) Compare and contrast between chemical catalysts and enzymes. (6)

b) With a neat diagram explain the working of a photobioreactor and enumerate its applications in the industry. (6)

c) Define yield coefficient and maintenance coefficient. (3)

5 a) Differentiate between Batch, Fed batch and Continuous bioreactors. (6)

b) Explain the Michaelis-Menten model for enzyme kinetics and discuss the relevance of the kinetic parameters. (9)

6 a) Give the application of enzymes in industrial and pharmaceutical fields with specific examples. (8)

b) With the aid of sketches explain what are growth associated and non growth associated products with examples. (7)

PART C

Answer any two full questions, each carries 20 marks.

7	a)	With neat sketches explain the flow patterns seen in a baffled and unbaffled stirred tank bioreactor.	(8)
	b)	With a neat sketch explain what is a biosensor and the components seen in a typical biosensor.	(6)
	c)	Name two important physical, chemical and biological parameters and the instruments used to measure these parameters in a bioreactor.	(6)
8	a)	Explain any one important method for measuring cell mass in a bioreactor.	(5)
	b)	Draw a neat diagram of a bioreactor with all its components and explain the various parts of the bioreactor and its functions .	(10)
	c)	Write note on aerobic fermentation process.	(5)
9	a)	Differentiate between on-line and off-line measurements taken in a bioreactor with examples of each.	(5)
	b)	Explain the measurement of pH and temperature in a bioreactor.	(8)
	c)	What are the factors affecting oxygen demand in a bioreactor and graphically represent the critical oxygen rate.	(7)

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