

GURU NANAK INSTITUTE OF TECHNOLOGY
An Autonomous Institute under MAKAUT
2020-2021

Enzyme Technology
FT702A

TIME ALLOTTED: 3 hours

FULL MARKS: 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable

GROUP – A

(Multiple Choice Type Questions)

Answer any **ten** from the following, choosing the correct alternative of each question: **10×1=10**

	Marks	CO No
1 (i) Vector used in r DNA technology is (a) Plasmid ; (b) Cosmid ; (c) Fosmid; (d) All of these	1	CO5
(ii) OUR is dependent on (a) K_L ; (b) K_{La} ; (c) Impeller speed ; (d) All of these	1	CO2
(iii) Enzymes are (a) Mixed growth associated product ; (b) Nongrowth associated product ; (c) Growth associated product; (d) none of these	1	CO4
(iv) Hydrolases enzymes include: (a) Racemases and oxygenases (b) Isomerases and lyases (c) Peptidases and lipases (d) Oxidoreductases and catalases	1	CO4
(v) The organism generally used for α -amylase production by mold fermentation (a) <i>Aspergillus niger</i> ; (b) <i>Aspergillus parasiticus</i> ; (c) <i>Saccharomyces cerevisiae</i> ; (d) None of these	1	CO2
(vi) Majority of enzymes used in food industry are (a) Transferases; (b) Isomerases; (c) Oxidoreductases; (d) none of these.	1	CO3

(vii)	Renet is mainly produced from (a) Plants; (b) Microbes; (c) Animals; (d) All of these.	1	CO3
(viii)	Enzymes belong to the following class of biomolecules (a) Carbohydrate; (b) Protein; (c) Fat; (d) None of these.	1	CO2
(ix)	Enzyme immobilization facilitates (a) Reuse; (b) Activity; (c) Loss; (d) Deactivation.	1	CO4
(x)	Salting in is used for (a) Medium preparation; (b) Purification; (c) Fermentation; (d) All of these.	1	CO2
(xi)	Which enzyme splits lactose (a) Beta-galactosidase; (b) Laccase; (c) Lyase; (d) Alpha-amylase.	1	CO3
(xii)	Enzymes are sensitive to (a) Heat shock; (b) pH shock; (c) Both a and b; (d) None of these.	1	CO1

GROUP – B

(Short Answer Type Questions)

(Answer any *three* of the following) **3 x 5 = 15**

		Marks	CO No
2.	Classify enzymes depending on their functions.	5	CO4
3.(a)	Why microbial source is favorable for enzyme production in comparison to other sources?	2	CO2
3.(b)	What should be the criteria of a microorganism selected for enzyme production?	3	CO2
4.	Describe the enzyme substrate reaction for sucrose and sucrose.	5	CO1
5.	What are sources of enzymes? Give one examples for each.	5	CO1
6.	Describe the physical methods of enzyme immobilization.	5	CO4

GROUP – C

(Long Answer Type Questions)

(Answer any *three* of the following) **3 x 15 = 45**

		Marks	CO No
7.(a)	What is rDNA technology?	1	CO5
7.(b)	Briefly explain the role of different enzymes in rDNA technology?	4	CO5
7.(c)	What is chimeric DNA?	1	CO5
7.(d)	What is the role of vector in r DNA technology?	2	CO5
7.(e)	Give one example each of natural and artificial vectors.	2	CO5
7.(f)	Give some potential applications of r DNA technology.	5	CO5
8.(a)	Derive the Ruth equation for constant pressure filtration.	7	CO2
8.(b)	The following data were obtained in a constant pressure filtration unit for filtration of a yeast suspension.	8	CO2

Characteristics of the filter are as follows:

$$A = 0.28 \text{ m}^2, C = 1920 \text{ kg/m}^3, \mu = 2.9 \times 10^{-3} \text{ kg/m-s}, \alpha = 4\text{m/kg}$$

t (min)	V (L filtrate)
4	115
20	365
48	680
76	850
120	1130

Determine

i) Pressure drop across the filter.

ii) Filter medium resistance (r_m)

iii) Determine the size of filter for the same pressure drop to process 4000 lit of cell suspension in 20 min

9. (a)	Describe in detail the enzymatic break-down process of starch to glucose? Provide schematic.	8	CO3
9. (b)	How the enzymatic clarification of fruit juices is conducted? Discuss in detail with example.	7	CO3
10. (a)	Define intracellular and extracellular enzymes with examples?	5	CO4
10. (b)	Differentiate between intracellular and extracellular enzymes.	5	CO4
10. (c)	Describe the process of synthesis of an intracellular enzyme with the help of a schematic diagram.	5	CO4
11. (a)	What are the methods used for purification of enzymes?	4	CO2
11. (b)	How ultra-filtration is used for purification of enzymes?	5	CO2
11. (c)	Describe the solvent extraction method of enzyme purification.	6	CO2