PARUL UNIVERSITY

PARUL INSTITUTE OF APPLIED SCIENCES

MID SEMESTER INTERNAL EXAMINATION, MARCH 2020

B. Sc. Microbiology Semester VI

Paper Name: Enzymology **Date: 04/03/2020**

Paper Code: 11103201 **Time: 1hr 30min**

Max. Marks: 40

Instructions:

1. All questions are compulsory and options are given in first and second question only.
2. Numbers to the right of question indicate the marks of respective question.

Q. 1 Attempt any one question of the following. **(08)**

(i) Explain the methods for homogenization of tissue.

(ii) Explain Sodium dodecyl sulphate gel electrophoresis.

Q. 2 Attempt any three questions of the following. **(12)**

(i) Write a short note on Ping-Pong mechanism.

(ii) Explain Ion-Exchange chromatography.

(iii) What do you mean by enzyme specificity? Write the Lock and Key model of enzyme specificity.

(iv) What is enzyme inhibition? Explain different types of enzyme inhibition.

(v) What is dialysis? Write the principle of dialysis for protein purification.

Q. 3 Do as directed. Attempt all five questions. **(05)**

(i) Define enzyme activity.

(ii) What do you mean by co-substrate and prosthetic group?

(iii) Define activation energy of enzyme.

(iv) What are the metalloenzymes?

(v) What is bi-substrate reaction?

Q. 4 Write correct option in your answer sheet for following 15 multiple choice questions. **(15)**

MCQ 1	Which dye is use to stain protein during PAGE?			
	(A)	Bromophenol blue	(B)	Coomasie blue
	(C)	Ethidium bromide	(D)	Victoria blue
MCQ 2	Affinity chromatography is based on the which property of protein:			
	(A)	Solubility of protein	(B)	Viscosity of protein
	(C)	Charge of protein	(D)	Specific binding affinity of protein
MCQ 3	Salting out process involves			
	(A)	Precipitation of protein using Ammonium sulphate	(B)	Precipitation of protein using Copper sulphate
	(C)	Precipitation of protein using Sodium chloride	(D)	None of these
MCQ 4	In gel filtration chromatography, separation of protein is based on:			
	(A)	Size and shape	(B)	Size and net charge
	(C)	Size and specific affinity	(D)	Shape and net charge

MCQ 5	In anion exchange chromatography,			
	(A)	The column contains negatively charged beads, where positive charged protein binds	(B)	The column contains positively charged beads, where negative charged proteins binds
	(C)	The column contains both positive and negative charged beads, where protein binds depending on their net charge	(D)	All of these
MCQ 6	Amylase which acts on α-1-4 glycosidic, bond in starch dextrin and glycogen, shows which type of enzyme specificity			
	(A)	Bond	(B)	Group
	(C)	Optical	(D)	Absolute
MCQ 7	By adding SDS during gel electrophoresis of protein, it is possible to:			
	(A)	Determine protein's isoelectric point	(B)	Determine enzyme's specific activity
	(C)	Determine protein's amino acid composition	(D)	Separate proteins exclusively on the basis of their molecular weight
MCQ 8	To determine the isoelectric point of a protein, first establish that a gel:			
	(A)	Contains a denaturing detergent that can distribute uniform negative charges over the protein's surface	(B)	Exhibit a protein's pH gradient when ampholytes become distributed in an electric field
	(C)	Is washed with an antibody specific to the protein of interest	(D)	Neutralizes all ionic groups on protein by titrating with them with strong bases
MCQ 9	Name the coenzyme of riboflavin (B2)?			
	(A)	NAD or NADP	(B)	FAD and FMN
	(C)	Coenzyme A	(D)	Thiamine pyrophosphate
MCQ 10	Which of these best describes how the substrate fits with the enzyme			
	(A)	The active site changes shape slightly to fit the substrate	(B)	The "induced fit" hypothesis
	(C)	It fits exactly into the active site	(D)	The "lock and key" hypothesis
MCQ 11	Which of these are advantages of lowering the activation energy?			
	(A)	It allows reactions to proceed more quickly	(B)	It allows reactions to proceed at an acceptable temperature
	(C)	It allows chemicals to react that otherwise wouldn't	(D)	It changes the optimum pH of the enzyme
MCQ 12	Inactive enzymes which are not bound to their cofactors are called			
	(A)	Apoenzymes	(B)	Coenzymes
	(C)	Holoenzymes	(D)	Co-substrates
MCQ 13	When an enzyme may act on one substrate by two different reaction types, reaction specificity is called as:			
	(A)	Optical specificity	(B)	Dual specificity
	(C)	Substrate specificity	(D)	None of them
MCQ 14	The general mechanism is that an enzyme acts by:			

	(A)	Reducing the energy of activation	(B)	Increasing the energy of activation
	(C)	Decreasing the pH	(D)	Increasing the pH
MCQ 15	The coenzyme is			
	(A)	Often a metal	(B)	Always a protein
	(C)	Often a vitamin	(D)	Always an inorganic compound

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