

**QUESTION ONE:**

- I. Write the Scientific Terms corresponding to each of the following sentences:

(18x1= 18 marks, 30 min)

No.	Sentences	Scientific Term
1.	A lipoprotein that transport dietary triglycerides to adipose tissues for storage	
2.	A class of lipids composed of sphingosine amino-alcohol, one molecule of fatty acid, and a polar head group.	
3.	An essential fatty acid which serves as a precursor for synthesis of prostaglandins	
4.	A steroidal compound that serves as a precursor for synthesis of vitamin D	
5.	Closely related variants of the same enzyme with the same catalytic functions, but with different physical and chemical properties	
6.	Non-protein organic molecules that are essential for enzyme activity	
7.	The substrate concentration at which the reaction rate is half of $V_{max}$	
8.	A spiral peptide chain held in place by hydrogen bonding between peptide bonds in the same chain.	
9.	The first intermediate with a complete purine ring in purine nucleotides de novo synthesis pathway.	
10.	A pathway that ensures the recycling of purines formed by the degradation of nucleotides.	
11.	The three-dimensional arrangement of	

	polypeptides in a protein comprised of multiple polypeptides.	
12.	A non-essential amino acid that is formed from phenylalanine by phenylalanine hydroxylase.	
13.	A non-essential amino acid that is synthesized from glutamate by cyclization and reduction reactions.	
14.	A process where unfolding and disorganization of both protein secondary and tertiary structures without hydrolysis of peptide bonds.	
15.	A term that refers to the continual renewal or replacement of proteins.	
16.	Replacement of an amino acid in protein with different one leading to retained 3D structure and biological activity.	
17.	An enzyme that convert methemoglobin heme bound Fe (III) to Fe (II) in hemoglobin.	
18.	Abnormal hemoglobin with a substitution of glutamate for lysine at position 6 of the globin chain.	

**QUESTION TWO:**

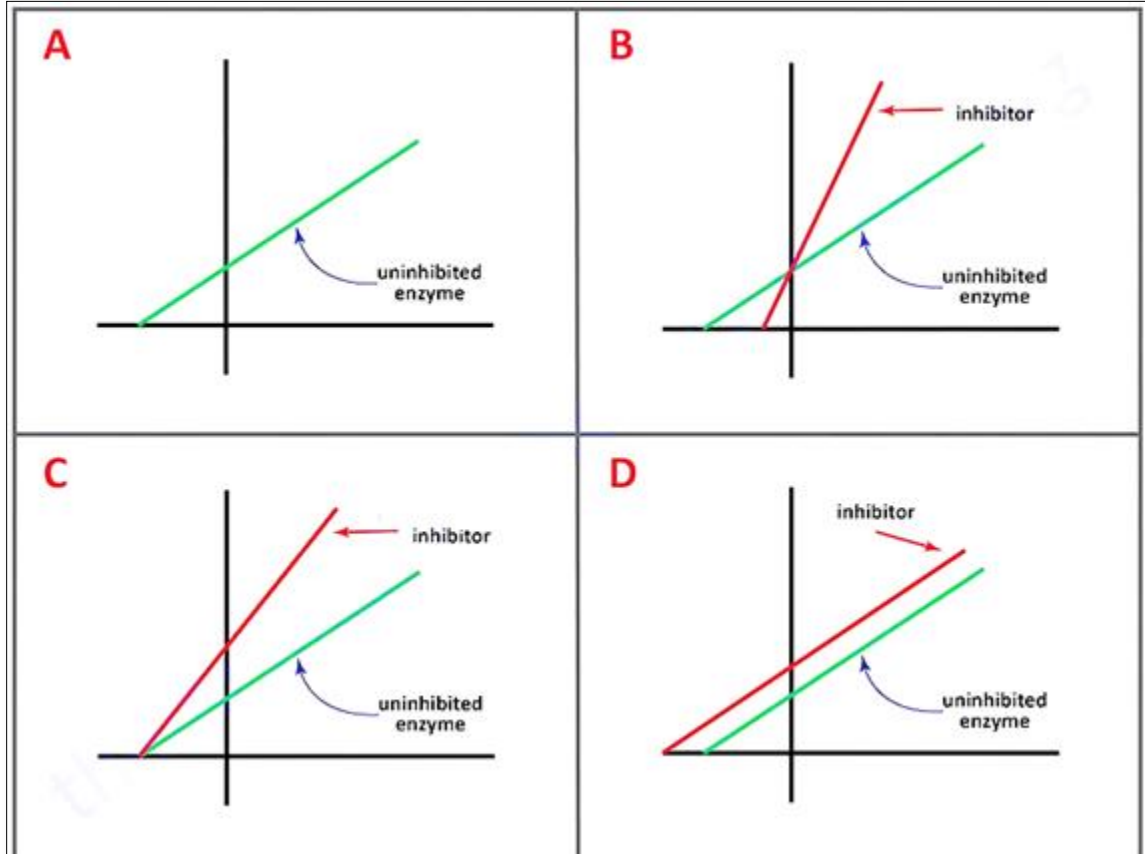
I. What are the main characteristics of Allosteric Enzymes?

(4 marks, 5 min)

**II. In the following diagram, you are provided with 4 types of reactions**

Reaction A: normal uninhibited reaction

Reactions B, C, and D are performed in the presence of inhibitors



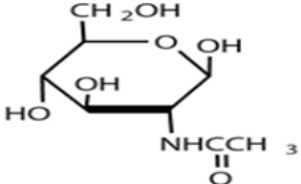
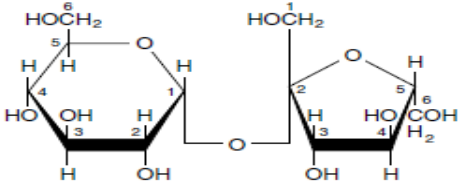
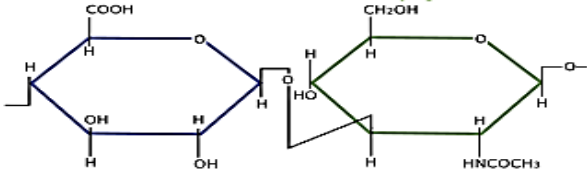
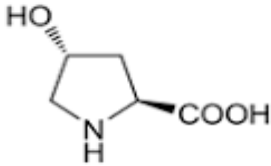
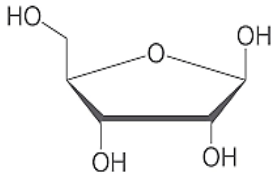
For reactions B, C, and D; Answer the following questions:

(6 marks, 15 min)

	Reaction B	Reaction C	Reaction D
Type of inhibitor			
Effect on V max			
Effect on Km			

**QUESTION THREE:**

I. Identify of the following substances: (5x 1= 5 marks, 10 min)

	Name	Biochemical Structure
1		
2		
3		
4		
5		

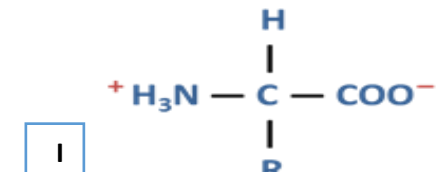
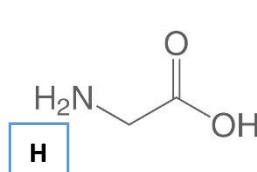
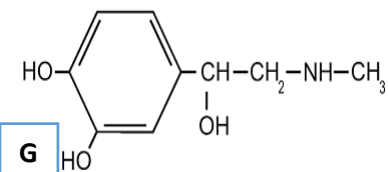
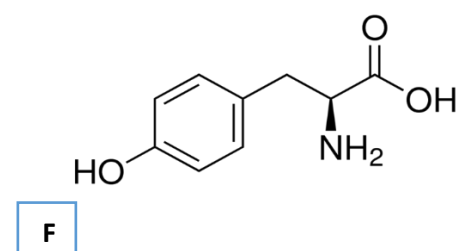
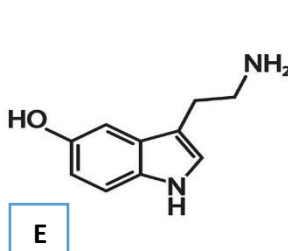
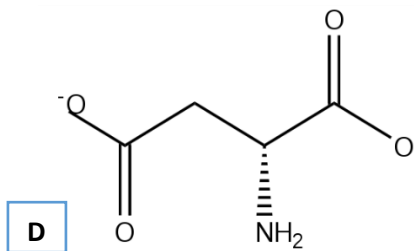
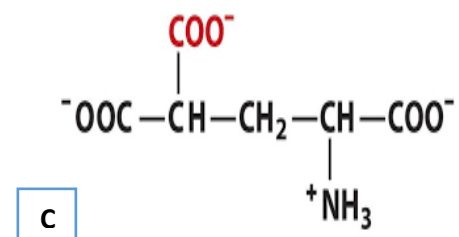
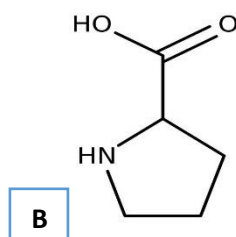
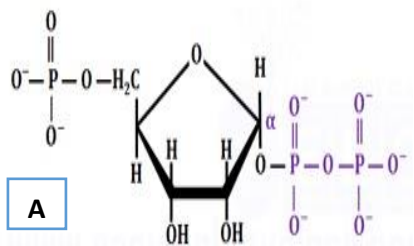
- II. Match each of the following enzymes in column (A) with its corresponding function in column (B): (8x0.5= 4 marks, 15 min)

(A) Enzyme name	(B) Enzyme function
1. Salivary $\alpha$ -amylase (.....)	a. Converts some of the lysyl residues in collagen to allysine
2. Thrombin (protease) (.....)	b. Breaks the connection to the membrane lipid and releases glypicans
3. Pancreatic $\alpha$ -amylase (.....)	c. Cleaves milk sugar producing galactose and glucose
4. Lactase (.....)	d. Breaks some $\alpha$ -(1→4) bonds of dietary starch in mouth
5. Isomaltase (.....)	e. Cleaves the $\alpha$ -(1→4) bond in isomaltose, producing glucose
6. Lysyl hydroxylase (.....)	f. Catalyzes the conversion of fibrinogen to fibrin
7. Lysyl oxidase (.....)	g. Converts lysine into hydroxylysine using vit C and molecular oxygen
8. Phospholipase (.....)	h. Cleaves the $\alpha$ -(1→6) bond in isomaltose, producing glucose
	i. Breaks $\alpha$ -(1→4) bonds of dextrin in the small intestine



**QUESTION FOUR:**

Select the appropriate structure form (A) to (I) that corresponds to each of the descriptions from (1) to (6):  
(6x1=6 points, 25 min)



Descriptions	Correct Answer
1. Amino acid formed at the isoelectric point (PI) which is electrically neutral.	
2. It is a non-essential amino acid that contributes to nitrogen atoms of both purine and pyrimidine rings.	

<b>3.</b> A neurotransmitter involved in the regulation of sleepiness and wakefulness, that is synthesized from tryptophan.	
<b>4.</b> Non-essential amino acid that has a secondary amino group and is frequently referred as to an "imino acid".	
<b>5.</b> Non-essential amino acid that is optically inactive and involved in the <i>de novo</i> synthesis of purine nucleotides and synthesis of serine.	
<b>6.</b> It's the activated sugar intermediate used as a substrate for <i>de novo</i> synthesis of purine nucleotides as well as the starting material in the salvage pathway.	

*Best wishes for all,,,,,,,,,*