بسمِ اللهِ الرحمٰن الرحيم

Biochemistry

Past Papers (2014-2022)/final

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Peptides

قَالَ مُوسَىٰ لِقَوْمِهِ اسْتَعِينُوا بِاللَّهِ وَاصْبِرُوا ۖ إِنَّ الْأَرْضَ لِلَّهِ
يُورِثُهَا مَن يَشَاءُ مِنْ عِبَادِهِ ۖ وَالْعَاقِبَةُ لِلْمُتَّقِينَ

2020

- **patients with phenylketonuria are advised to ingest an aspartame-like sweetener with phenylalanine replaced by:**
  A) Tyrosine
  B) Valine
  C) Tryptophan
  D) An amino acid analog
  E) Alanine

Answer: E

2021

- **The letter that represents the peptide bonds is :**

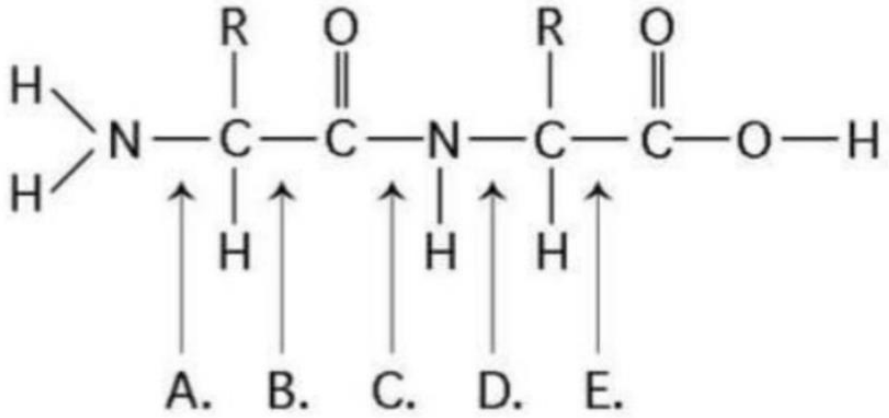
A) A

B) B

C) C

D) D

E) E



Answer: C

2014&2015

- **This peptide Tyr-Gly-Gly-Phe-Met is a natural peptide in the brain. Which ofthe following statements is true:**

A) it's a natural occurring analgesic.

B) There's a peptide that's very similar to it and contains leucine instead ofmethionine.

Answer:both

2014&2015

- **You have a sequence of amino acids arranged in a tetrapeptide. The aminoacids are lysine, methionine, glutamic acid, and tyrosine. When this tetrapeptideis treated with chymotrypsin , it gives you a free glutamic acid and a positively-charged tripeptide , when treated with trypsin , it gives you a free lysine with anegatively charged tripeptide , and when treated with cyanogen bromide , it givesyou two dipeptides , one is positively charged and the other is negativelycharged. What is the proper sequence of the tetrapeptide:**

  Answer : Lys-Met-Tyr-Glu

Protein structure

وَأَن لَّيْسَ لِلإِنسَانِ إِلاَّ مَا سَعَى، وَأَنَّ سَعْيَهُ سَوْفَ يُرَى

2022

- **In what structure are the CDR's found?**

A) Helical structure
B) Alpha helix
C) Loop
D) Beta sheet
E) Globular folding

Answer: C

2011

- **disulfide bonds are most important in this type of structure :-**

A) tertiary structure
B) primary structure
C) secondary structure
D) quaternary structure
E) all of the above

Answer: A

2011

- **which of the following forces are involved in maintaining the primary structure of protein** :

A) covalent bond
B) hydrogen bond
C) ionic bond
D) hydrophobic bond

Answer: A

2011

- **which of the following amino acid is unlikely to be found in an alpha-helix due to its cyclic structure :**

A) Phenylalanine
B) tryptophan
C) Proline
D) lysine

Answer: C

2011

- **the overall folding of a single protein subunit is called :**

A) tertiary structure
B) secondary structure
C) quaternary structure
D) all of the above

Answer: A

2011

- **which of the following best defines a domain :**

A) super-secondary region , often shared by proteins that has aspect function.
B) repetitive super-secondary structure
C) double bond layered arrangement formed so that the polar group face the aqueous environment while the non polar region are kept away from the aqueous environment- an unfolded region of protein

Answer: A

2011

- **which of the following best describe the motif :**

A) repetitive super secondary structure
B) common non-repetitive irregularity found in antiparallel beta sheet.
C) protein conformation with biological affect -group of atoms other than amino acid

Answer: A

2011

- **protein that aid in the correct and timely folding of other proteins are called :**

A) motifs
B) chaperone
C) liposome
D) cooperative

Answer: B

2020

- **Amphipathic alpha-helices exist in:**

A) Conjugated, multimeric proteins
B) Ion channels
C) Extracellular proteins
D) Cysteine-rich proteins with disulfide bonds
E) Membrane receptor with a single transmembrane domain

Answer: B

2020

- **This type of amino acids preferentially exist in beta-turns but not alpha helices:**

A) Polar amino acids
B) Aromatic amino acids
C) Amino acids with branching at the beta-carbon
D) Proline and Glycine
E) Non-polar, aliphatic amino acids

Answer: D

2020

- **How many bands would be produced when hemoglobin is subjected to denaturing, non-reducing SDS-PAGE?**

A) No bands will be detected
B) 1
C) 2
D) 4
E) 3

(the alpha and beta are very similar in molecular weight)

Answer: B

2020

- **One of the following is TRUE in regards to prion disease:**
  A) The defective prion protein disrupts protein synthesis
  B) The disease is caused by defective chaperones
  C) The prion protein does not have a tertiary structure
  D) The disease can be inherited
  E) It is a human-specific disease

Answer: D

2020

- **The secondary structures that make up domains are stabilized by**:

A) Proline residues
B) Hydrogen bonds
C) R groups
D) Disulfide bonds
E) Prosthetic groups

Answer: B

2020

- **Beta-alanine is part of this molecule:**

A) Carnosine
B) Glutathione
C) Aspartame
D) Oxytocin
E) Elastin

Answer: A

2021

- **The best discerption of the primary structure is :**

A) The localised organisation of parts of a polypeptide chain

B) The three-dimensional structure of the protein

C) The sequence and type of amino acid residues

D) The number and relative positions of the subunits in a multimeric protein

E) None of the above

Answer: C

2021

- **The disease that does not result from misfolding :**

A) Alzheimer

B) Analbuminemia

C) Creutzfeldt –Jacob

D) Scrapie

Answer: B

2021

- **The secondary structure is characterised by:**

A) The sequence of amino acids

B) The hydrogen bonds between R groups

C) The hydrophobic interactions between the amino acids

D) The hydrogen bonds between amine and carbonyl groups

Answer:D

2021

- **Which of the following will be denatured by heat?**

A) Immunoglobulin
B) Elastin
C) Myoglobin
D) Keratin
E) Collagen

Answer: C

2019

- **The following are components of the secondary structure:**

A) Motif
B) Domain
C) Amino acid sequence
D) Prosthetic groups
E) Turn

Answer: E

2014
2015

- **In secondary structure of a protein, there is:**

A) H bonds between amide group and carboxyl group in the backbone of amino acids.
B) interactions between subunits.
C) interactions through side chains of amino acids.

Answer: A

Fibrous proteins

وَأَوْرَثْنَا الْقَوْمَ الَّذِينَ كَانُوا يُسْتَضْعَفُونَ مَشَارِقَ الْأَرْضِ
وَمَغَارِبَهَا الَّتِي بَارَكْنَا فِيهَا ۖ وَتَمَّتْ كَلِمَتُ رَبِّكَ الْحُسْنَىٰ
عَلَىٰ بَنِي إِسْرَائِيلَ بِمَا صَبَرُوا ۖ وَدَمَّرْنَا مَا كَانَ يَصْنَعُ
فِرْعَوْنُ وَقَوْمُهُ وَمَا كَانُوا يَعْرِشُونَ

2022

- **What gives keratin its characteristic strength?**

A) Hydrophobic interactions
B) Ionic bonds
C) Disulfide bridges
D) Hydrogen bonds

Answer: C

2022

- **What is the correct sequence of structural units formed during collagen synthesis?**

A) Alpha chains - tropocollagen - microfibril - fiber - fibril
B) Tropocollagen - alpha chains - fibril – fiber
C) Alpha chains - tropocollagen - microfibril - fibril - fiber
D) Fiber - fibril - microfibril – tropocollagen
E) Alpha chains - microfibril - tropocollagen - fiber

Answer: C

2022

- **Collagen is bound to sugars due to what reaction?**

A) Carboxylation
B) Hydroxylation
C) Hydrogenation
D) Dehydration
E) Dehydroxylation

Answer: B

2011

- **vitamin c (ascorbic acid) prevent survey because :**

A) it's involved in formation the proper beta sheet of collagen
B) it's involved in metabolism of heme used in hemoglobin
C) it encourages the formation of disulfide linkage in collagen
D) it's unusual amino acid found in primary structure of collagen
E) it's used to hydroxilate proline in the primary structure of the protein.

Answer: E

2011

Beta-turns

- **the two amino acid frequently found in reverse turns are :**

A) tyrosin & tryptophan
B) serine & threonin
C) glycin & proline
D) leucine & isoleucin

Answer: C

2020

- **The following residue of collagen is important in intracellular signaling**
  A) Hydroxyproline
  B) Glycine
  C) Hydroxylysine
  D) Allysine
  E) Proline

Answer: C

2020

- **Temporary hair styling involves:**
  A) Reformation of covalent linkages
  B) Dihydroxylation of amino acid residues
  C) Reformation of non-covalent interactions
  D) Removal of sugar attachments
  E) Synthesis of more alpha keratins

(hydrogen bonds)
Answer: C

2020

- **Elastin fibers tend to aggregate back together after stretching due to**
  A) The lysine crosslinks
  B) The hydroxyproline residues
  C) Their hydrophobic nature
  D) The attached carbohydrates
  E) The proline residues

Answer: C

2020

- **The following is NOT important in packing collagen fibrils and fibers:**

A) Lysine
B) Allysine
C) Proline
D) Hydroxyproline
E) Hydroxylysine

Answer: C

2021

- **Which of the following bonds is not found in fibrous proteins?**

A) Hydrogen bonds

B) Phosphodiester bonds

C) Peptide bonds

D) Disulfide bonds

Answer: B

2021

- **One of the following is not true about fibrous proteins:**

A) Glycine and proline residues are abundant in collagen,elastin and keratin proteins

B) Disulfide bonds within keratin are the reason for curly hair

C) Hydroxyproline in collagen is necessary for its stability

D) Collagen is glycosylated at hydroxylysine residues

E) Lysine is involved in cross linking elastin molecules

Answer: A

2019

- **Protofibrils are composed of?**

A) Two protofilaments
B) Two alpha keratin chains
C) Two intermediate filaments
D) Two alpha keratin tetramers
E) Two coiled coil keratin dimers

Answer: A

2018

- **What is the basic functional unit for collagen ?**

  The answer is : 3 alpha strand (not sure)

2018

- **What is the function of allysine ?**

  Answer : cross linking

2019

- **Lysine, allysine, and hydroxylysine are important in cross-linking collagen molecules, butin elastin, cross-linking occurs due to:**

A) Hydroxyproline
B) Lysine and allysine only.
C) All three molecules as well.
D) There is no cross-linking in elastin fibers.
E) Cysteine residues

Answer: B

Globular proteins (myoglobin and hemoglobin)

الخيل الاصيلة بتشد بالاخر
اللهم يسر ولا تعسر

2022

- **One of the following statements is wrong according to myoglobin:**

A) The P50 for myoglobin is 2.8 torr
B) It contains 8 alpha helices
C) The ferrous ion within the heme group can form 6 bonds
D) It is an allosteric protein
E) It is a monomeric protein

Answer: D

2022

- **Which statement about oxygen binding in hemoglobin is incorrect?**

A) Causes conformational change
B) Higher O2 affinity in high O2
C) O2 binds to heme's iron
D) O2 binds directly to His residues
E) O2 doesn't bind to heme ferric ion

Answer: D

2022

- **What is the main reason in which hemoglobin is considered as an allosteric protein?**

A) It has a quaternary structure
B) It has different structures
C) It has many electrostatic interactions
D) It can be regulated by effectors

Answer: D

2022

- **Hemoglobin can transition between the R (relaxed) state and T (tense) state as part of its allosteric regulations. Which statement best describes the structural changes when hemoglobin transitions from the R state to the T state?**

A) The heme groups are oxidized
B) The alpha and beta subunits dissociate
C) The salt bridges between dimers are broken
D) The electrostatic interactions reform between dimers

Answer: D

2019

- **A single point amino acid change from His143 in HbA to serine in fetal hemoglobin (HbF) results in higher affinity of HbF to oxygen. This is because:**

A) Reduced formation of carbamates
B) Stabilization of R form of hemoglobin
C) Reduced chloride shift
D) Reduced binding to 2,3-bisphodsphoglycerate
E) Reduced Bohr effect

Answer: D

2011

- **the structure of myoglobin consist of :**

A) almost entirely of alpha helix
B) almost entirely of beta sheet
C) mixture of alpha & beta
D) of unique secondary motif that is neither alpha helix or beta sheet .

Answer: A

2011

- **why does the myoglobin have histidine thatprevent both secondary CO from binding perpendicularly to the hemi plan :**

A) this increase myoglobins affinity for O2
B) this increase myoglobins affinity for CO2
C) this lessees the difference in myoglobins affinity for CO2 versus O2
D) this prevents the iron of the heme from being oxidized

Answer: C

2011

- **in what oxidation state must the iron atom be forhemitobindO2 :**

A) -0 , Fe (0)
B) +1 , Fe (I)
C) +2 , Fe (II)
D) +3 , Fe (III)
E) there is no require oxidation state to use iron

Answer: C

2011

- **which of the following is not a characteristic of hemoglobin :**

A) it contain two different type of subunits
B) it contain prosthetic group
C) it's an allosteric enzyme
D) all of these are true

Answer: D

2011

- **in the bohr effect the binding of oxygen to hemoglobin :**

A) is increased by the presence of Na+.
B) is increased by the presence of H+/CO2 .
C) is decreased by the presence of H+/CO2 .
D) is unchanged

Answer: C

2011

- **the affinity of fetal hemoglobin for oxygen :**

A) has not been studied
B) the same as that of adult hemoglobin
C) is lower than that of maternal hemoglobin
D) is higher than that of maternal hemoglobin

Answer: D

2020

- **The reason why myoglobin cannot be allosteric is because:**

A) Heme does not change shape when it binds oxygen
B) Myoglobin is a conjugated protein
C) Myoglobin binds with a strong affinity to oxygen
D) Myoglobin is a muscle-specific protein
E) Myoglobin is monomeric

Answer: E

2020

- **The sigmoidal shape of the oxygen saturation curve of hemoglobin indicates that:**
  A) Hemoglobin is a hetero-multimeric protein
  B) Hemoglobin is a conjugated protein
  C) Hemoglobin is a holoprotein
  D) Hemoglobin is an allosteric protein
  E) Hemoglobin has a prosthetic group

Answer: D

2020

- **Distal histidine has this significant role in hemoglobin:**

A) It prevents the entry of carbon monoxide into the heme binding coreb.
B) It covelantly links the heme group to hemoglobinc.
C) It reduces iron when oxygen is released and iron is oxidizedd.
D) It stabilizes oxygen binding to heme via the formation of hydrogen bonding with ite.
E) It makes affinity of hemoglobin to carbon monoxide lower than that of oxygen

Answer: D,A

2021

- **The R conformation of hemoglobin always predominates in one of the following tissues:**

A) Muscles

B) Lungs

C) Liver

D) RPCs

Answer: B

2021

- **Choose the wrong statement about the distal histidine in hemoglobin :**

A) Works as a gate

B) Stabilises the binding of oxygen

C) Keep the Fe in the oxidised state

Answer: C

2021

- **If the O2 in a certain tissue is 3 mmHg ,what will happen ?**

A) The myoglobin will be partially saturated

B) The myoglobin will be fully saturated

C) The hemoglobin will be fully saturated

D) Can't be determined

Answer: A

2019

- **This is how the propionate groups of heme molecules are positioned in both myoglobinand hemoglobin:**

A) They are covalent linked to distal histidine.
B) They are oriented towards the exterior surface of the protein.
C) They are covalently linked to proximal histidine.
D) They are hidden inside the protein.
E) They are linked to one of the internal alpha helices

Answer: B

2019

- **You have the following molecules: glycine, aspartate, sucrose, collagen, and hemoglobin. One of these statements is NOT correct:**

A) Aspartate is eluted first from anionic exchange chromatography.
B) Concanavalin A- bound beads in affinity chromatography can be used to purify sucrose.
C) Dialysis can be used to isolate collagen and hemoglobin from the other molecules.
D) Sucrose does not bind to beads of cationic exchange chromatography.
E) Glycine comes out last in size exclusion chromatography

Answer: A

2014&2015

- **Both hemoglobin and myoglobin have all these characteristics in commonEXCEPT:**

A) their subunits are held together by noncovalent interactions.
B) They bind on O2 per heme.
C) They bind heme in a hydrophobic pocket.

Answer: A

Immunoglobulins

وَآخَرُونَ يَضْرِبُونَ فِي الْأَرْضِ يَبْتَغُونَ مِنْ فَضْلِ اللهِ

2022

- **Which class of antibody appears as a pentamer in its secreted form?**

A) IgA
B) IgD
C) IgE
D) IgG
E) IgM

Answer: E

2022

- **What is the function of CDR's?**

A) They regulate the binding between the antigen & the antibody
B) They make the antibody more flexible
C) They bind specifically to the antigen
D) They have the same primary structure between idiotypes
E) They are present in the hinge region of the antibody

Answer: C

2022

- **Which statement that refers to the definition of allotypes ?**

A) They differ in the constant region but possess the same variable region
B) They differ in the variable region but possess the same constant region
C) They are from different individuals
D) They differ in the constant and the variable region
E) None of the above

Answer: C

2020

- **In order to immortalize a B cell to produce a monoclonal antibody:**
  A) Mutations are created
  B) B cells are just activated by an antigen
  C) B cells with immunoglobulin M are selected
  D) B cells undergo class switching
  E) B cells are fused with cancer cells

Answer: E

2020

- **Cysteines play an important role in the formation of the quaternary structure of this protein:**
  A) Myoglobin
  B) Collagen
  C) Carbonic anhydrase
  D) Hemoglobin
  E) Immunoglobulin

Answer: E

2021

- **The antigen binds specifically to which part of antibody?**

A) Fc domain

B) Fab domain

C) CDR

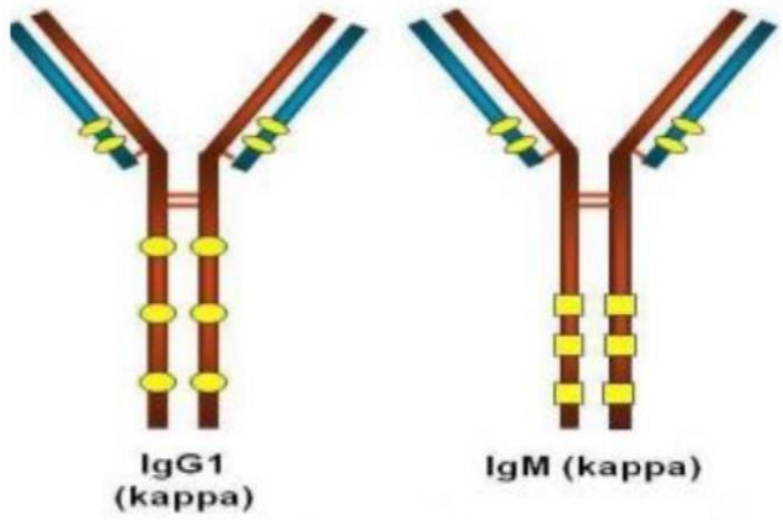
D) Hinge region

Answer: C

2021

- **The relation between these two antibodies:**

A) Idiotypes
B) Isotopes
C) Allotropes
D) A+C
E) There is no relationship



Answer:B

2019

- **Class switching involves:**

A) Changing the hypervariable region of antibodies.
B) Changing the constant region of antibodies only.
C) Changing the variable region of antibodies only.
D) Changing the B cells that produces the antibodies.
E) Changing both the variable and constant regions of antibodies

Answer: B

2018

- **one of following is false about the diversity of immunoglobulin ?**

  Answer : alternative splicing

2019

- **The main purpose of the hinge region of antibodies is:**

A) Antibody clearance
B) Binding phagocytic cells
C) Allowing better binding to antigen
D) Site of sugar binding
E) Binding to antigenic epitopes

Answer: C

Plasma proteins

اللهم صل على سيدنا محمد صلاة تخرجنا بها من ظلمات الوهم و تكرمنا بها بنور الفهم و توضح لنا ما أشكل علينا حتى نفهم وعلى آله وصحبه وسلم تسليما

2022

- **In size-exclusion chromatography, which protein size would elute second from a column?**

A) 25 kDa
B) 50 kDa
C) 145 kDa
D) 200 kDa

Answer: C

2021

- **The best description of C-reactive protein?**

A) Acute –phase inflammatory protein
B) Help in the defence against bacteria
C) It's level reaches a peak after 2 days
D) Undetectable in healthy individuals
E) All of the above

Answer : E

2021

- **What is true about α1 –antitrypsin ?**

A) High amount of it will active elastase

B) Synthesised primarily by the fetal yolk sac

C) A tetramer

D) A polymorphic

Answer: D

Enzymes (introduction)

إنَّ اللَّهَ يُحِبُّ :قال رَسولَ اللهِ صَلَّى اللَّهُ عليه وَسَلَّمَ
.العَبْدَ التَّقِيَّ، الغَنِيَّ، الخَفِيَّ

2016

- **Which statement is true regarding the active site of an enzyme?**

A) It is always hydrophobic.
B) It undergoes permanent changes as a result of the binding of a substrate
C) It can distinguish stereoisomers.
D) It forms irreversible bonds with the substrate.
E) It is found on the surface of the enzyme to provide accessibility for the substrate

Answer: C

2022

- **Which one of the following is an example of a non-protein enzyme?**

A) Apozyme
B) Ribozyme
C) Chymotrypsin
D) Pepsinogen

Answer: B

2022

- **Digestive enzymes are** :

A) Ligases
B) Transferases
C) Oxidoreductases
D) Layases
E) Hydrolases

Answer: E

2022

- **Which of the following statements about enzyme catalysis is false?**

A) Lowering the activation energy
B) Increasing the reaction rate
C) Reducing the change in free energy
D) Stabilizing the transition state
E) Lowering the energy of the transition state

Answer: C

2022

- **What is an apoenzyme bound to its cofactor called?**

A) Holoenzyme
B) Cofactor enzyme
C) Zymogen
D) Proenzyme

Answer: A

2022

- **What is the inactive form of an enzyme called?**

A) Proenzyme
B) Apoenzyme
C) Hydrolyase
D) Lipoenzyme

Answer: A

2016

- **Which one of these doesn't cause that effect on enzyme denaturation?**

A) A-high T

B) B- low T

C) C-70%ethanol

D) D-increasing PH

Answer: B

2016

- **Under non reducing condition a protein exist as 40KD band and after reducing condition it will appear as 30KD and 10KD bands this represent?**

Answer: This protein is a heterodimer (ChatGPT)

2016

- **Which one of these is the reason for decreasing the rate of the reaction?**

A) high concentration of the product

B) high concentration of the substrate

C) high concentration of the enzyme

D) none of the above

Answer: A

2020

- **The following DOES NOT characterize enzymes' active sites:**

A) They possess a minimum of three binding points to substrateb.
B) Compared to the rest of the enzyme's structure, they are comparable in sizec.
C) Typically, they look like a pocket, canal, or creviced.
D) They possess multiple weak attraction forces to physiological substartese.
E) Large active sites usually have two separate, independent sites, catalytic and binding

Answer: B

2020

- **If you were told that chymotrypsin action on a decapeptide does not result in hydrolysis of that peptide. Then, which of the following sequences might NOT be part of the decapeptide? (Edited)**
  A) Ile-Tyr-Pro-His-Gly
  B) Arg-Ser-Cys-Asp
  C) Arg-Asp-Gln-Trp
  D) Ala-Thr-Asn-Phe
  E) Ser-Cys-Tyr-Pro

Answer: B

2020

- **If you were told glycogen phosphorylase enzyme is an allosteric enzyme, then:**

A) Active phosphatase results in more T state of the
B) phosphorylase than the R state
C) cAMP activates glycogen phosphorylase directly
no answer is true
D) Epinephrine binding eventually results in a larger L ratio
E) Glycogen phosphorylase kinase is an allosteric enzyme as well

Answer: A

2020

- **Suppose you have 100 molecules of an enzyme (an aspartyl protease) that requires aspartate in the active site for catalysis. pKa of Asp side chain is 4.5 and you did your experiment in the presence of the proper substrate concentration and environment and at pH 4.5. then:**
  A) Repeating the experiment at pH 7.5 results in achieving Vmax
  B) Vmax is decreased
  C) Repeating the experiment at pH 1.5 results in achieving Vmax
  D) All enzyme molecules will be active
  E) Vmax can be achieved

Answer: A

2020

- **Considering the enzyme ”Carbonic anhydrase”. What is true? (choose the best answer)**
  A) More than one answer is true
  B) Requires TPP
  C) Requires Se
  D) Requires Zn+2
  E) May be referred to as 3.2.1.1

Answer: D

2020

- **You have the following sequence of a peptide “Arg-Pro-Asp-Lys-Arg-Cys-TrpTyr-Lys-Arg”. After treating this peptide with trypsin, how many peptide fragments would be generated?**
  A) 3
  B) 4
  C) 2
  D) 1
  E) Cannot be guessed

Answer: C

2021

- **What is wrong about the active site of enzymes?**

A) Specific three-dimensional shape

B) It's found on the surface of the enzyme

C) Takes up a relatively small part of the total volume

Answer:B

2021

- **The wrong mechanism of enzymes is :**

A) Catalysis by bond strain
B) Michaelis –Menten mechanism
C) Acid –base catalysis
D) Covalent catalysis
E) Proximity effect

Answer:B

2021

- **What is true about the active site of enzymes?**

  Answer: There should be 3 points for binding

2021

- **The specific function of enzymes is :**

Answer : Reducing the activation energy

إياك أن تحلم بقمة الجبل و خطاك ضعيفة رخوة!

2021

- **Monooxygenases are class of :**

A) Isomerase
B) Lyases
C) Transferases
D) Hydrolyses
E) Oxidoreductases

Answer:E

2021

- **The major class that catalyses intramolecular rearrangement is :**

A) Ligases

B) Transferases

C) Oxidoreductases

D) Mutases

E) Translocases

Answer: D

2019

- **An enzymatic reaction proceeds through 3 transition states. They have free energy (G) values of 2.3, 4.2, and 1.2 kcal/mol in order of appearance. If you know that G of substrate is 1.9 kcal/mol and G of product is 3.6 kcal/mol. What is the activation energy?**

A) 8 kcal/mol
B) 0.4 kcal/mol
C) 2.3 kcal/mol
D) 1.7 kcal/mol
E) -0.7 kcal/mol

Answer: c

2018

- **Which is the major classification for decarboxylase ?**

  The answer is : lyases

2018

- **What is the function of proteasomes ?**

The answer is : degradation of proteins

2011

- **the active site of an enzyme:**

A) remains rigid & doesn't change shape
B) is found at the centre of globular enzyme
C) Is complementary to the rest of the molecule
D) contains amino acids without side chains
E) none of the above is correct

Answer: B

2011

- **Treatment of a peptide with trypsin generates a dipeptide that is positively charged atpH 7. Further treatment of this peptide with chymotrypsin generates two single aminoacids. The dipeptide is:**

A) Asp- Lys
B) Val- Met
C) Arg- Trp
D) Gly- Val
E) Phe-Lys

Answer: E

2011

- **To which class of enzyme does an enzyme that catalyzes this reaction (A+B+ATPADP +Pi) belong:**

A) Oxidoreductase
B) Hydrolase
C) Ligase
D) Lyase
E) Transferase

Answer: C

2019

- **The reason why enzymes need to bind to substrates at, at least, three points is:**

A) To ensure high affinity of binding.
B) To catalyze reaction faster.
C) To differentiate isomers of substrates.
D) To allow binding to more than one substrate.
E) To allow for electron rearrangement of substrates

Answer: C

2014&2015

- **Which of the following statements is not true about enzymes**

A) They are all proteins with no exceptions.

B) They are stereospecific to their substrates.

Answer: A

2014&2015

- **Which of the following is true about the reaction that coverts of pyruvate tooxaloacetate, knowing that this reaction is catalyzed by pyruvate carboxylase enzyme :**

A) TPP is the coenzyme in the enzyme catalyzing this reaction.

B) Consumption of raw eggs may affect the reaction.

Answer: B

2014&2015

- **The oxide ion that participates in the first nucleophilic catalysis in themechanism of action of chymotrypsin came from:**

A) Aspartate.
B) Histidine.
C) Serine.
D) Glycine.
E) Water.

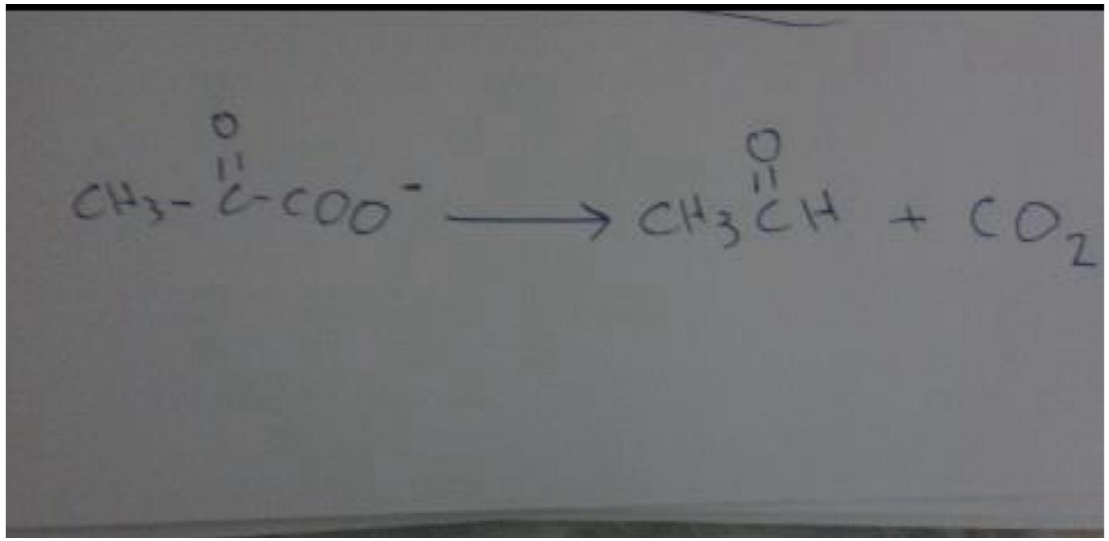
Answer:c

if the question was about the second nucleophilic catalysis, the answer would be"e"

2014
2015

- **The process of this reaction is:**

A) carboxylation
B) hydrolysis
C) oxidation
D) decarboxylation



Answer: D

2014
2015

- **About transition state analog:**
  Answer is more stable than transition state

Enzymes (kinetics)

الرسول صلى الله عليه وسلم كان اذا حزبه امر
فزع الى الصلاة وقال يا حي يا قيوم برحمتك
الصلاة حتى تستحضر المشاكل فتأتي ..استغيث
الحلول
اذكروا أمتكم في ركعتي قيام

2011

- **how much faster is a reaction with the fastest enzyme than without the catalyst :**

A) about 10 times faster
B) about 100 times faster
C) About 1000 times faster
D) About 100,000 times faster
E) About 10^20 times faster

Answer: E

2022

- **If you know that Km is equal to [S], it means that:**

A) The enzyme kinetics follow K system
B) Half of the enzymes are bound to substrates
C) The reaction velocity is equivalent to Vmax
D) The enzymes are fully saturated with the substrate
E) None of the above

Answer: B

2022

- **A biochemist obtains the following set of data for an enzyme that is Known to follow Michaelis-Menten kinetics. Approximately, Vmax of this Enzyme is……& the Km is…….**

A) 5000 & 699
B) 699 & 5000
C) 621 & 50
D) 94 & 1
E) E)700 & 8

Substrate Concentration (μM)	Initial velocity (μmol/min)
1	49
2	96
8	349
50	621
100	676
1000	698
5000	699

Answer: E

2016

- **With a substrate concentration of 0.03, the velocity of the catalyzed reaction is 1.5. Knowing that the substrate concentration at a velocity which is half the maximum velocity of the catalyzed reaction is 0.06, find the velocity by which the turnover number can be calculated:**

A) 0.2025
B) 4.5
C) 2
D) 2.25
E) 3.5

Answer: B

2022

- **What value is most important to calculate to measure the purity & quality of an enzyme in a sample to potentially use it as a therapeutic treatment?**

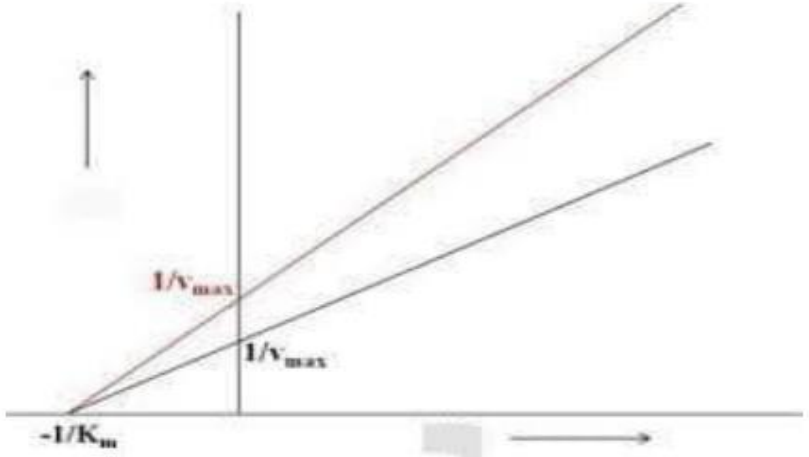
A) Km value
B) Enzyme efficiency
C) Specific activity
D) Isoelectric point
E) Turnover number

Answer: C

2022

- **Select the right answer according to the type of inhibition that occurs to this enzyme (SMILE) depending on the change of its kinetics depicted by lineweaver-burk's plot:**

A) Competitive inhibition
B) Uncompetitive inhibition
C) Non-competitive inhibition
D) Suicide inhibition



Answer: C

2021

- **Which of the following inhibitors act as the following blot ?**

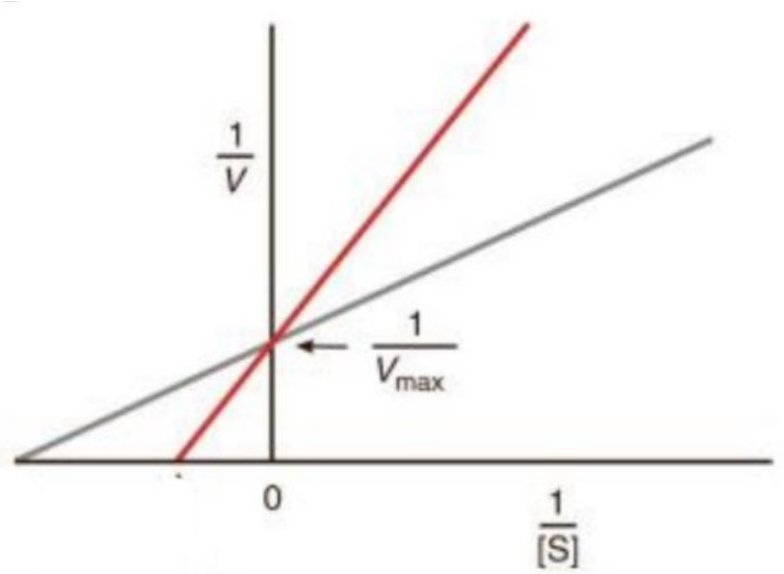
A) Penicillin

B) Sarin

C) Aspirin

D) Glucose phosphate

E) Alop



Answer: D

2016

- **What is the velocity if the concentration of the substrate is 60microM and the km.3microM?**

A) 0.95 Vmax
B) 0.85 Vmax
C) 0.75 Vmax

Answer: A

2020

- **A solution initially a saturating concentration of (0.0025 mol/L) of a peptide substrate and 25 µg chymotrypsin in a volume of 1 ml. after 6 minutes, 0.0019 mol/L of peptide substrate remain. The molar mass of chymotrypsin is 25,000 g/mol. Accordingly, what can be deduced?**
  A) No answer is can be deduced
  B) KM equals 0.2 uM
  C) The substrate contains Arg and/or Lys residues not followed by Pro
  D) Kcat equals 100/min
  E) The reaction rate equals 0.01 M/min

Answer: E

2020

- **Which of the following statements considering hexokinases is TRUE?**

A)Km value is identical for hexokinase I and IV under high substrate concentrationb.
B) No answer is truec.
C) The main mechanism of regulation of hexokinase IV (glucokinase) is feedback inhibitiond.
D) Hexokinase I efficiency will decrease dramatically in fasting e.
E) Increasing hexokinase I or IV concentration increases their Kcat value

Answer: B

2020

- **You performed an experiment on an enzyme that follows Michaelis-Menten kinetics with a Km value of 0.01 uM. The velocity of the enzyme at a substrate concentration of 10 uM ia approximately at:**
  A) 50% of Vmax
  B) 0.001 of Vmax
  C) Its Vmax
  D) 33% of Vmax
  E) 99% of Vmax

Answer: E

2020

- **An imaginary reaction catalyzed by the enzyme medicinase has the following values: the association rate constant of E and S into ES is 4 / µM.s, the dissociation rate constant of ES into E and S is 6/s, and the dissociation rate constant of ES into E and P is 14/s. Accordingly:**

A) Kcat value is closed to the catalase enzyme
B) The Km value is close to the physiological range
C) None of the answers is true
D) The actual affinity is very high
E) The specificity constant is larger than one

Answer: E

2021

- **What is the ratio of V to Vmax if [S]= 9 Km ?**

A) 1.11

B) 0.09

C) 1

D) 0.9

Answer: D

2020

- **A 1 µM solution of glutathione peroxidase is present in solution with its proper substrate and at saturating conditions. The product formed at a rate of 0.5 M/s. if the reaction is gone to completion, then:**

A) Kcat equals 5 million per second
B) Kcat equals 0.000002 per second
C) The product is reduced and water is formed
D) The product concentration is half of that of the substrate
E) Oxygen is incorporated into the substrate

Answer: C

2019

- **Reducing enzymes concentration in a reaction by half results in:**

A) Increasing Km of enzyme by double.
B) No effect on Kcat, Vmax or Km.
C) Decreasing Vmax of the reaction by half.
D) Decreasing Kcat of the enzyme by half.
E) Decreasing Km of the enzyme by half.

Answer: C

2018

- **You are working on the enzyme dentistry which has a molecular weight = 1 g/mol , you have used 30 ɱg (microgram) of the enzyme in an experiment , and the results show that the enzyme – at best – converts 1 micro mol/ min at 25 c̊. The turn over number (Kcat) of the enzyme is:**

A) can't be defined
B) 0.5 1/s
C) 2 1/s
D) 5.5 *10^-4 1/s

Answer: D

2018

- **If reaction (a) has ΔG= -200 and reaction (b) has ΔG= -10 :**

A) Reaction (a) is faster than reaction (b).
B) Reaction (b) is faster than reation (a).
C) (a) and (b) have the same speed .
D) We can't decide from this information.

Answer : D

2011

- **if the Y-intercept of a line weaver-burk plot = 1.91 second/milimole and the slope = 75.3 L/sec V max equals:**

A) 0.0254 miilimoles/second
B) 0.523 millimoles/second
C) 5.23 millimoles/second
D) 39.4 millimoles/second
E) 75.3 millimoles/second

Answer: B

2011

- **if the Y intercept of a line weaver bulk plot =1.91sec/mmol and the slope= 75.3 L/sec then Km equal:**

A) 0.0254 miilimoles per second
B) 0.523 millimoles per second
C) 5023 millimoles per second
D) 39.4 millimoles per second
E) 75.3 millimoles per second

Answer: D

2011

- **the value of Vmax changes in:**

A) competitive inhibition
B) noncompetitive inhibition
C) Both forms of inhibition
D) neither form of inhibition

Answer: B

2011

- **when [S] = Km the velocity of an enzyme catalyzed reaction is about:**

A) 0.1*V max
B) 0.2*V max
C) 0.3*V max
D) 0.5*V max
E) 0.9*V max

Answer: D

2011

- **Use this table to answer 4 questions**:

M	⟹	N	⟹	O	⟹	P	⟹	Q	⟹	R
	1		2		3		4		5	

- **which 2 enzymes would be the most likely ones to regulate this pathway is Dedicated to the formation of only one product:**

A) 2,4
B) 1,3
C) 1,5
D) 1,2
E) 4,5

Answer: D

2011

- **Use this table to answer 4 questions**:

M	⟹	N	⟹	O	⟹	P	⟹	Q	⟹	R
	1		2		3		4		5	

- **which 2 enzymes would be the most likely ones to regulate if this pathway is freely reversible and can go both ways:**

A) 2,4
B) 1,3
C) 1,5
D) 1,2
E) 4,5

Answer: C

2011

- **Use this table to answer 4 questions**:

M	⟹	N	⟹	O	⟹	P	⟹	Q	⟹	R
	1		2		3		4		5	

- **the final product R will most likely inhibit which reaction:**

A) 1,2
B) 1,3
C) 1,5
D) 2,4
E) 4,5

Answer: C

2011

- **Use this table to answer 4 questions**:

M	⟹	N	⟹	O	⟹	P	⟹	Q	⟹	R
	1		2		3		4		5	

- **which of the following is not required for enzyme to display cooperative kinetics:**

A) multiple subunits
B) a value for the Michaels constant ,Km
C) Allosteric sites which effect the binding of substrate to the active site
D) Ability to display a V max
E) all of these are characteristic of cooperative enzymes

Answer: B

2011

- **What is the turnover number for an enzyme knowing that 3 ug of the enzyme (molecularweight = 3,000,000) gives a Vmax of 1 umol of product per second:**

A) 3 million per micro-second
B) 30 million per second
C) 1 million per second
D) 9 million per second
E) 3 million per second

Answer: C

2014&2015

- **In an experiment, a biochemist uses an enzyme with highly concentratedsubstrate (] S =[10000 Km). After 5 minutes, 100 micromolar of the product were formed. In another experiment, he used 0.2 of the enzyme concentration that was used in the first experiment and the same substrate concentration. Expect the time needed to form the same amount of the product (100 micromolar).**

  Answer : 25 minutes

2014&2015

- **Suppose that you have [s] =10Km, then the velocity of reaction as a fraction ofVMax is:**

A) 0.091
B) 0.31
C) 0.01
D) 0.1
E) none of the above

0.909 V_{max}

Answer: E

2014&2015

- **You have a reaction A+B……C and V=K [B], the true about this reaction is**

A) the reaction is independent on [C].
B) the unite of K is (time)-1.
C) The reaction is independent on B

Answers: A&B

2014&2015

- **You have two enzymes, the first (1) acts on substrate A with Km =0.05 and VMax= 100, theother (2) acts on substrate B with Km=0.1 and VMax= 50, which of following is true:**

A) enzyme 2 has catalytic activity higher than enzyme 1
B) substrate A binds faster than B
C) you can increase V max of enzyme 2 by increasing in [B]
D) affinity of B is higher than A
E) None of the above

Answer: B

Enzymes (regulation)

أحبُّ الناس إلى الله أنفعهم للناس، :أيُّ الناس أحبُّ إلى الله ؟ فقال !يا رسول الله
وأحبُّ الأعمال إلى الله عز وجل، سرور تدخله على مسلم، تكشف عنه كربة، أو
تقضي عنه دينا، أو تطرد عنه جوعا، ولأن أمشي مع أخ في حاجة، أحبُّ إلي من
.أن أعتكف في هذا المسجد، يعني مسجد المدينة شهرا

2022

- **Which cardiac enzyme is typically tested in the laboratory to diagnose myocardial reinfarction ?**

A) Troponin
B) Creatine kinase MB isoenzyme (CK-MB)
C) Lactate dehydrogenase (LDH-1)
D) Aspartate aminotransferase (AS)

Answer: B

2022

•Which statement is true about the rate limiting step of a metabolic pathway?

A) It is reversible
B) It releases the most energy
C) It has the fastest rate constant
D) It is highly regulated
E) It is always the committed step

Answer: D

2022

- **What type of regulation does phosphorylation provide for controlling enzyme activity and function?**

A) Irreversible regulation
B) reversible covalent
C) Non-competitive regulation
D) Reversible regulation
E) irreversible covalent

Answer: D

2019

- **One of the following does NOT favor R- to T-state transition of glycogen phosphorylase:**

A) ATP
B) Phosphorylation
C) Glucose-6-phosphate
D) AMP
E) Glucose

Answer: D

2022

- **Which form of glycogen phosphorylase predominates when glycogen degradation is actively occurring?**

A) T form & phosphrylated phosphorylase
B) R form & phosphorylase A
C) T form & phosphorylase A
D) R form & phosphorylase B

Answer: B

2022

- **Enzymatic activity is regulated by:**

A) Allostery
B) Non-specific regulation
C) Reversible covalent modification
D) Modulators
E) All of the above

Answer: E

2022

- **What is the effect of the binding of ATP to the ATCase ?**

A) It will become in the T state
B) K0.5 will increase
C) K0.5 will decrease
D) The effect will be like the binding of CTP
E) Nothing will happen

Answer: C

2020

- **One of the following is a suicide inhibitor:**

A) Aspirin
B) Parathion
C) Sarin
D) Malathion
E) Penicillin

Answer: E

2020

- **According to what you have studied, the best enzyme to investigate within 24 hours of the incidence of infarction is:**

A) Total LDH
B) LDH1/LDH2
C) LDH1
D) Total CK
E) CK-MB

Answer: E

2020

- **If you are shown a figure that illustrates the behavior of a simple enzyme where: (1) the x-axis represents substrate concentration and the y-axis represents initial reaction rate and (2) shown in the figure are 2 hyperbolic plots, both of which reach the same Vmax value. Then, the figure represents the enzyme:(choose the best answer)**

A) Under normal and non-competitive inhibition effect
B) With more than one substrate
C) Under normal and competitive inhibition effect
D) Using different enzyme concentrations
E) More than one answer is true

Answer: C

2020

- **Suppose you designed a covalent inhibitor for the enzyme transpeptidase. Compared to the covalent inhibitor, the enzyme's action on penicillin is differently characterized by: (choose the best answer):**
  A) More than one answer is true
  B) Lowering the activation energy
  C) Covalent binding
  D) Similar affinity
  E) Initiation of a reaction

Answer: C

2020

- **Rate limiting steps are: (Choose the best answer)**
  A) Usually, not a committed step
  B) Characterized by a low affinity of the substrate toward the enzyme's active site
  C) Usually requiring a high amount of energy
  D) Usually, a reversible step
  E) More than one answer is true

Answer: E

2016

- **Which reaction is driven by PLP ?**

A) Alanine(3C) to pyruvate(3C)

B) Alanine(3C) to oxaloacetate(4C)

C) pyruvate(3C) to acetyl Co-A(2C)

Answer: A

2020

- **A carbon atom within a molecule does not have a hydroxyl group bound to it. This molecule is considered a substrate for an enzyme. The enzyme results in binding of a hydroxyl group to that carbon atom. Accordingly, the enzyme might be:**

  A) A lyase
  B) A hydrolase
  C) Any choice might be true
  D) An oxidoreductase
  E) An isomerase

Answer: C

2019

- **Although creatine phosphokinase MB (CPK-MB) is not the predominant enzyme in cardiac muscle cells, it is an excellent biomarker of myocardial infarction because:**

A) It is a zymogen.
B) It is exclusively present in cardiac muscle cells and not in other cell types.
C) It is released in large quantities.
D) It lasts in blood for a relatively long time.
E) The ration CPK-MB/CPK-MM is flipped and becomes more than 11.

Answer: C

2019

- **One of the following is NOT true in regard to small monomeric G proteins:**

A) They are active when GTP replaces GDP.
B) GTP-exchange factors activate the proteins.
C) GTPase activating proteins inhibit these proteins.
D) GDP dissociation inhibitors are activators of the proteins.
E) They get inactivated when GTP is released and replaced by GDP.

Answer: E

2019

- **One of the following is TRUE in regard to covalent inhibitors.**

A) They are transition analogs.
B) They allow enzymes to start reactions then they bind to their active sites.
C) They compete with substrates in binding to active sites of enzymes.
D) They chemically modify active sites of enzymes.
E) They bind to and chemically modify regulatory sites of enzymes.

Answer: D

2019

- **40- One of the following is NOT true in regard to aspartate transcarbamoylase (Atcase):**

A) Binding of an inhibitor shuts off enzyme activity completely.
B) Regulation occurs through altering affinity of binding, not maximal activity.
C) CTP is a homotropic allosteric inhibitor.
D) ATP is a homotropic allosteric activator.
E) It is composed of multiple active sites.

Answer: D

2019

- **One of the following is NOT true in regard to rate-limiting reactions:**

A) They are reversible.
B) They are driven by highly regulated enzymes.
C) They are driven by consuming energy.
D) They are slow reactions.
E) They are driven by enzymes with relatively low affinity to their substrates.

Answer: A

2018

- **One of these is a difference between competitive and non-competitive inhibition ?**

Answer : the way of inhibitor binding

2018

- **Which one of these sentence is wrong ?**

A) As ph value increases , the enzyme activity increases.

B) As temperature increases , the enzyme activity increases.

C) The enzyme activity doesn't depend on ph value.

Answer : A

2011

- **irreversible inhibitors of enzymatic reactions:**

A) bind to the enzyme only at low temperature
B) affect only serine side chains
C) React with the enzyme to produce protein that is not enzymatically active & form which the original enzyme can't be regenerated
D) bound to the enzyme by the lock-&-key mechanism

Answer: C

2011

- **CTP is a known inhibitor of ATCase the enzyme that catalyzes the first reaction in the pathway for the synthesis of this compound this is an example of:**

A) irreversible inhibition
B) feedback inhibition
C) Zymogene inhibition
D) negative cooperatively

Answer: B

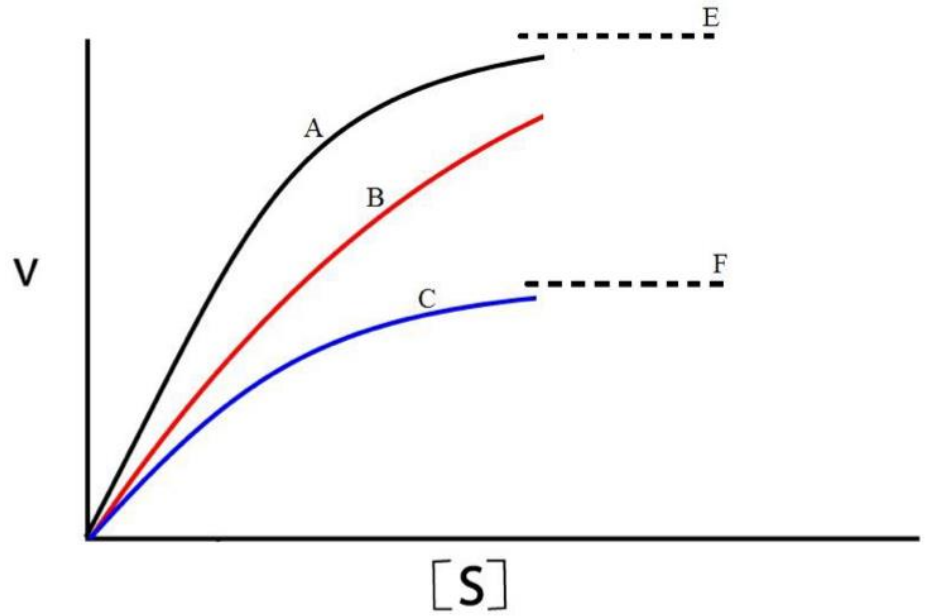
2018

- **Which is the first product result from zymogen?**

Answer : chymotrypsin

- **consider the following graph to represent an enzyme that works on its substrate under inhibition & no inhibition , according to this , answer the following three questions:**

2011



- 1))which letter represent the maximal reaction rate of enzyme activity under noncompetitive inhibition?? F
- 2))which letter represent enzyme activity under no inhibition?? A
- 3))which letter represent enzyme under competitive inhibition?? B

2019

- **An enzyme inhibitor binds to a regulatory site and alters the active site preventing thesubstrate from binding. What is true about this inhibitor:**

A) It decreases both Km and Vmax.
B) It is a non-competitive inhibitor.
C) It increases Km and decreases Vmax.
D) It is a suicide inhibitor.
E) It is an uncompetitive inhibitor

Answer: B

2019

- **Lactate dehydrogenases 1 (all H) and 5 (all M) differ in all of the following EXCEPT:**

A) Tissue distribution
B) Isoelectric point
C) Regulation
D) Substrate preference
E) Overall quaternary structure

Answer: E

2014&2015

- **Which of the following types of regulation is not a physiological way of regulation:**

A) Isozymes
B) Competitive inhibition
C) Irreversible inhibition
D) through conformational changes
E) Allosteric activation

Answer: C

2014&2015

- **Which of the following is true about protein kinase A:**

A) composed of one regulatory subunit and two catalytic subunits.
B) Binding of cAMP phosphorylates it.
C) Can be activated by adrenaline.

Answer: C

2014&2015

- **Which of the following is true about G-proteins:**

A) present as either dimeric or trimeric G-proteins.
B) GTP is exchanged by GDP to inhibit it.
C) The more alpha subunits are dissociated, the more targets are activated.
D) None of the above.

Answer: C

2014&2015

- **Which of the following statements is true about the enzyme aspartatetranscarbamoylase:**

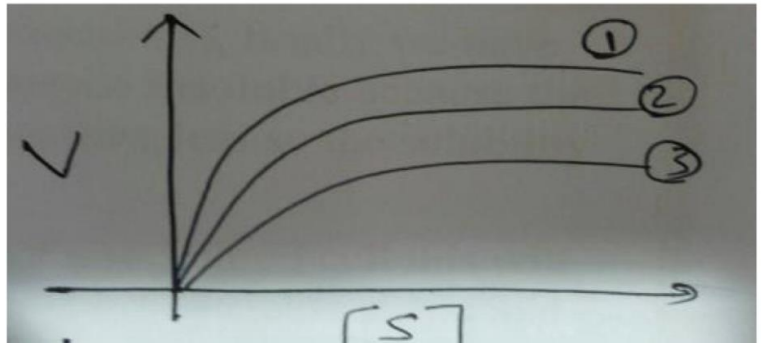
A) it's composed of one subunit.
B) It exhibits cooperative binding to the substrate.
C) CTP is an inhibitor and binds to the active site.
D) ATP is an activator and binds to the active site.

Answer: B

2014&2015

- **This figure shows you three Michaels-Menten curves of an enzyme.Curve 1 represents the enzyme without inhibition, while curves 2 and 3 show youthe enzyme with different concentrations of an inhibitor. Reaction velocity isplotted on the y-axis and the substrate concentration on the x-axis. Which of thefollowing statements is correct about it :**

A) The inhibitor is competitive.
B) In Lineweaver-Burk plot, the three curves intersect in the y-axis.
C) In Lineweaver-Burk plot, the three curves have no intersections.
D) the three curves have the same VMax value.
E) None of the above.

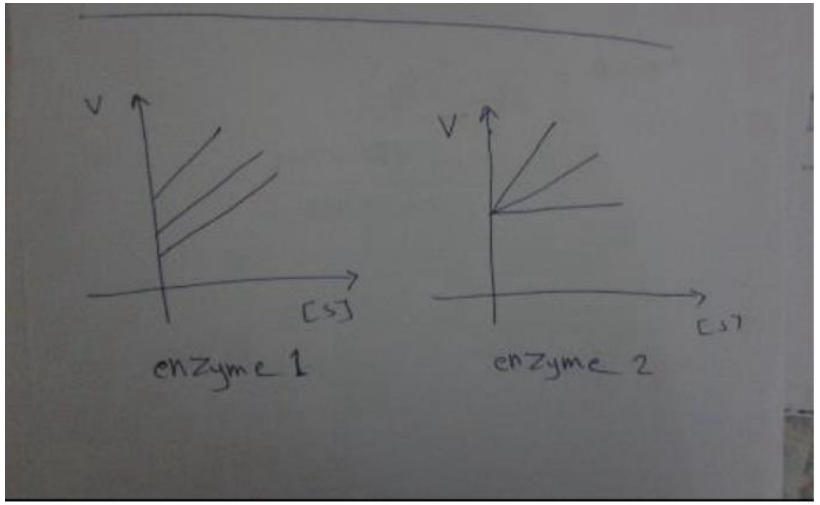


Answer: E

2014&2015

- **You have two enzymes without inhibition, the enzyme(s) that follow Michalis equation whenyou change the concentration of the two enzymes in three experiments with different values is :**

A) enzyme 1
B) enzyme 2
C) both of them
D) neither 1 nor 2
E) I can't determine

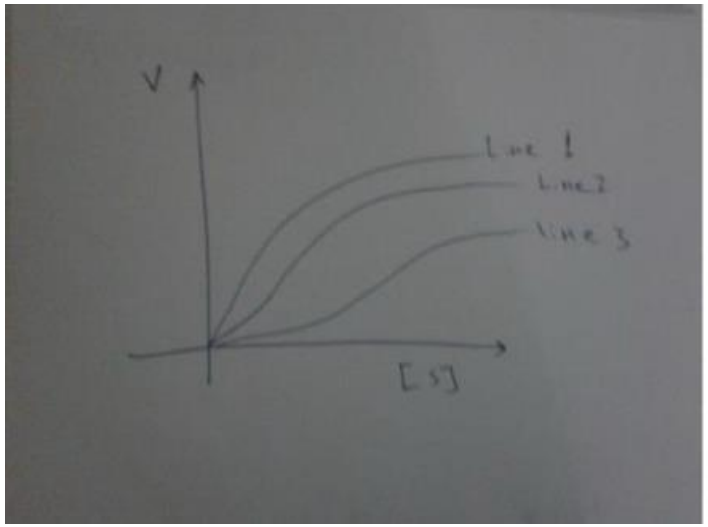


Answer: A

2014&2015

- **Which line represents an allosteric enzyme in a normal condition (without inhibition oractivation):**

A) Line 1
B) Line2
C) Line 3
D) can be line 1 or 2
E) Can be line 2 or 3.



Answer: B

2014
2015

- **The catalytic effect of the enzyme occurs through:**

A) lowering the energy level of products.
B) lowering the energy level of transition state.

Answer: B

2014
2015

- **False about inhibition:**

A) DEP binds on hydroxyl group of serine in acetylcholinesterase.
B) Allopurinol>>>>> (Mo-S) complex.
C) lead inhibits enzyme through replacing the normal functional metal.
D) mercury binds to enzyme often at reactive hydroxyl group of serine.

Answer: D

2014
2015

- **The best description of pH and temperature effect on enzyme is:**

A) As pH increases, the rate increases until we reach the maximum
B) As temp. Increases, the rate increases until we reach the maximum

Answer : Both are correct

Enzymes (cofactors)

اللهم مدداً من ..اللهمّ انتصر لهم ..اللهمّ ارحم ضعفهم وآوِهم وقوّهم
اللهمّ اغفرلنا عجزنا وقلّه حيلتنا نشكوا إليك ضعفهم ..لدنك يا رحيم
.وهوانهم على النّاس يا أرحم الراحمين يا لطيف يا قريب يا مُجيب
اللهم أعزّ الإسلام والمسلمين وأذلّ الشرك والمشركين، وأرِنا فيهم أياماً
سوداً كأيام عادٍ وثمود واشفِ صدور قومٍ مؤمنين يا الله

2022

- **Why are metal ions useful as cofactors for many enzymes?**

A) They stabilize tertiary structure
B) They allow enzymes to work at extreme pH
C) They facilitate the binding of multiple ligands
D) They increase the rate of diffusion

Answer: C

2021

- **The cofactor which doesn’t bind covalently is :**

A) CoA

B) PLP

C) Biotin

D) TTP

E) NAD+

Answer: E

2020

- **One of the following is a precursor for the synthesis of CoA:**

A) None of the answers is a precursor
B) Pantothenic acid
C) Acetyl group
D) Niacin
E) Biotin

Answer: B

2019

- **One of the following is NOT true in regard to flavin adenine dinucleotide (FAD):**

A) It is needed for the function of lactate dehydrogenase.
B) It forms a radical during reactions.
C) It binds covalently to enzymes.
D) It accepts two electrons sequentially.
E) It works with oxidoreductase enzymes.

Answer: A

2019

- **The phosphate groups of thiamin pyrophosphate and ATP requires this to bind to activesites of enzymes:**

A) They do not need a mediator.
B) Coenzyme A
C) Zinc iond
D) FADH2 or NADH
E) Magnesium ion

Answer: E

2014&2015

- **Which of the following (vitamin- chemical structure - action)**

A) vitamin A - retinal - vision.
B) Vitamin D - 1, 25-dihydrocholeciferol - regulates calcium and phosphorusmetabolism.
C) Vitamin E - alpha-tocopherol - antioxidant.
D) Vitamin K - the presence of isoprene units - coagulation.
E) Non of the above .

Answer: D

2014&2015

- **One of these enzymes is synthesized first as a zymogen:**
  Answer : chymotrypsin

2014&2015

- **One of these mechanisms in not employed by chymotrypsin during its action:**

A) acid-base catalysis.
B) Nucleophilic attack.
C) The presence of Zn in the active site.
D) Covalent intermediate formation.
E) Proximity and orientation.

Answer: C

Lipid-soluble vitamins

الباقيات الصالحات
سبحان الله
والحمدلله
ولا اله الا الله
والله اكبر

2022

- **Thiamin pyrophosphate is involved in what reactions?**

A) Decarboxylation
B) Phosphorylation
C) Carboxylation
D) Dehydrogenation

Answer: A

2022

- **Which of the following is a correct match of a vitamin & its active form:**

A) NAD+ , Vitamin B3
B) FMN, Vitamin B7
C) Coenzyme A, Vitamin B6
D) Acetyl CoA, Vitamin B9

Answer: A

2018

- **which vitamin is involved in decarboxylation reactions?**

Answer : thiamine

Biochemical techniques

"ماض واعرف ما دربي وما هدف
فامضوا ولا تترددوا
رحم الله القائد

2022

- **You have the following unordered steps of ELISA, choose the correct Order of them:**

i- We add a solution of the enzyme's substrate to the wells.
ii- We put the primary antigen in the well & attach it to the surface There.
iii- We pour a solution of a secondary antibody which is specific for the Antigen & also is bound to an enzyme by its Fc region.
iv- We add a solution containing the antigen to the wells.

A) i,iii,ii,iiii
B) Ii,iii,iiii,i
C) Ii,iiii,iii,i
D) Ii,iiii,I,iii
E) Ii,I,iiii,iii

Answer: C

2022

- **What is the function of the sodium dodecyl sulfate in polyacrylamide Gel-electrophoresis?**
- A) It separates the fragments based on their shape
- B) It makes the protein fragments positively charged
- C) It separates the fragments depending on their solubility
- D) It breaks disulfide bridges but not amide bonds
- E) It separates fragments depending on their molecular weight

Answer:E

2022

- **protein has a molecular weight of 60 kDa in its native state. Firstly, we purified a sample containing the protein by molecular-sieve chromatography, then we used SDS-PAGE to analyze the protein with urea-containing SDS-gel, the observed band had a weight of 30 kDa. When using an SDS-gel which contains urea & Beta-mercaptoethanol, a single band was observed at 15 kDa. What can you conclude about the structure of this protein under native conditions?**

A) It is a heterodimer with 1 disulfide bridge between the subunits
B) It is a homodimer with 1 disulfide bridge between the subunits
C) It is a homotetramer with electrostatic interactions between its subunits
D) It is a homotetramer with disulfide bridges between two of its subunits
E) It is a homotetramer with disulfide bridges between all of its subunits

Answer:D (بتنسى السؤال شو طالب و انت بتقراه:)

2022

- **You have the following peptide, choose the correct statement: Val-Met-Arg-Gly-Phe-Glu-Asn-Tyr-Asp-Cys-Arg-Leu-Ser-Ile-Pro-Lys-Phe**

A) Using trypsin yields 4 peptide fragments
B) Using pepsinogen yields 4 peptide fragments
C) Using elastase yields 4 peptide fragments
D) Using chymotrypsin yields 3 peptide fragments

Answer: D

2022

- **What two properties does 2D SDS-PAGE separate proteins according to?**

A) Size and shape
B) Size and solubility
C) Size and charge
D) Shape and charge

Answer: C

2022

- **What is the technique that reveals the structure and dynamics of proteins in a solution?**

A) X-ray crystallography
B) PCR
C) Nuclear magnetic resonance
D) Electrophoresis
E) ELISA

Answer: C

2022

- **You have 5 different proteins (A, B, C, D and E), with different isoelectric points (pI's). pI for A = 5.1 / pI for B = 6.8/ pI for C = 8.2/ pI for D = 9.5/ pI for E = 11.3 Starting the column at pH 1, the sample is added and then washed to remove unbound molecules.What is the order of protein elution when gradually increasing the pH in cationic-exchange chromatography?**

A) a,b,c,d,e
B) b,c,d,e,a
C) a,d,c,b,e
D) e,d,c,b,a

Answer: A

2022

- **Which of the following techniques involve the fractionation of proteins with high salt concentration?**

A) Salting in
B) Ion-exchange chromatography
C) Gel filtration chromatography
D) Salting out
E)dialysis

Answer: D

2021

- **The stronger binding between the stationary phase and proteins :**

A) Earlier the elution

B) When we increase the concentration of salt

C) During the elution

D) Later the elution

Answer: D

- **Enzymes Q19 : the typical order for the major steps of enzyme Isolation would be from first to last :**

A) homogenization / salt fractionation / electrophories / column chromatography
B) homogenization / column chromatography / salt fractionation / electrophories
C) homogenization / salt fractionation / column chromatography / electrophories
D) homogenization / electrophories / salt fractionation / column chromatography

Answer: C

2011

- **which separate on the basis of molecular weight :**

A) gel filtration
B) affinity chromatography
C) cation exchange
D) anion exchange
E) cation or anion exchange

Answer: A

2022

- **In cationic exchange chromatography, if the pH of the mobile phase is 8. Which of the following amino acids would be fully eluted?**
  A) Arginine
  B) Aspartic acid
  C) Tyrosine
  D) Histidine
  E) Cysteine

Answer: B

2020

- **In molecular sieve chromatography:**

A) The protein to be purified is originally included in the stationary phase
B) The output of elution is very crude
C) The higher the molecular weight of the protein is, the later it elutes
D) The molecular weight of the eluted protein can be estimated
E) The higher the solubility of the protein is, the later it elutes

Answer: D

2020

- **Starting from a crude sample, you have purified an enzyme using dialysis. Upon running SDS-PAGE electrophoresis, there were 2 bands; one at 60 KDa and the other was at 20 KDa. Under reducing conditions, there were also two bands, one at 40 KDa and the other at 20 KDa. What does that tell you about the structure of the enzyme?**
  A) The enzyme might be composed of a single subunit of 20 KDa
  B) The enzyme might be a heterotrimer
  C) The enzyme might be a homodimer
  D) The enzyme might be composed of a single subunit of 60 KDa
  E) The enzyme might be a heterotetramer

Answer: B

2011

- **which would be best to separate a protein that binds strongly to X substrate :**

A) gel filtration
B) Affinity chromatography
C) Cation exchange
D) Anion exchange
E) cation or anion exchange

Answer: B

2011

- **elution of protein by means of pH gradient would work best with this type of column :**

A) gel filtration
B) affinity chromatography
C) Cation exchange
D) Anion exchange
E) cation or anion exchange

Answer: E

2011

- **in the chromatography the experimental setup always requires:**

A) stationary phase & mobile phase
B) Spectrophotometric detecting device
C) Sample in which components differ in charge
D) sample in which components differ in polarity

Answer: A

2011

- **the degree of separation in molecular sieve chromatography depend on:**

A) the polarity of the mobile phase
B) The pKa of the buffer material in mobile phase
C) The chemical nature of the sieve material
D) the size of the pores in sieve material

Answer: D

2011

- **in the SDS-PAGE method separation takes place on the basis of:**

A) charge only , because all particles have different charges but the same mass
B) the sieving action of the gel , because all particles have the same charges , but different masses
C) the sieving action of the gel , because all peptide have approximately the same charge/mass ratio but different masses
D) the chemical nature of the buffer used as the electrolyte

Answer: C

2011

- **how many bonds would be produced when hemoglobin is subjected to SDS-PAGE:**

A) 1
B) 2
C) 3
D) 4

Answer: B

- **What is the sequence of processes of protein elusion ?**

  Answer : Homogenization – ion exchange – salting out – affinity Chromatography

2019

- **This technique is NOT dependent on size of molecules:**

A) Polyacrylamide gel electrophoresis
B) Dialysis
C) Two-dimensional gel electrophoresis
D) Isoelectric focusing
E) Gel filtration chromatography

Answer: D

2019

- **The use of reducing agents will NOT affect the bonding pattern in SDS-PAGE of thefollowing protein:**

A) Immunoglobulin G
B) Keratin
C) Immunoglobulin M
D) Hemoglobin
E) Oxidized glutathione

Answer: D

2019

- **X-ray diffraction of electrons is used to:**

A) Measure the rate of protein movement induced by an electrical current.
B) Purify cofactors bound to enzymes.
C) Determine protein structure in solid state.
D) Calculate distance of chain movement in liquid environment.
E) Ionize proteins prior to chromatography

Answer: C

2014&2015

- **Suppose that you have to do ion-exchange chromatography using an anion-exchanger to separate lysine, histidine and glutamic acid from one another in a solution. What's the proper order of their elution out of the column?**
  Answer : Glu - His - Lys

2014&2015

- **If you want to separate a cationic protein from other proteins in the solution,which purification technique you will use:**

A) Salting out.
B) Affinity chromatography.
C) Anion exchange chromatography.
D) Cation exchange chromatography.
E) None of the above.

Answer: C

- **Did you forget to pray for your oppressed Muslim brothers today?**

اللهم منزل الكتاب، ومجري السحاب، وهازم الأحزاب، اهزمهم وانصرنا عليهم .
ولا حول ولا قوة إلا بالله القويّ المتين

سبحانك اللهم وبحمدك، نشهدُ أن لا إله إلا أنت، نستغفرُكَ ونتوبُ إليك.

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