



# Zoology Legends

# BIO202

**Current Final TERM Spring 2023**

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# Zoology Legends

## MCQS Final Term Spring 2023

- pKa of the -COOH group in the range of 1.8 to 2.4
- pKa of the -NH<sub>3</sub><sup>+</sup> group in the range of 8.8 to 11
- purines include: **hypoxanthine and xanthine**
- Purine bases: ..... **Adenine (A) and Guanine (G)**
- The deleterious effects of trans fats occur at intakes of \_\_\_\_\_ **2 to 7g/Day**
- The mammalian ribosomes contains two major nucleoproteins subunits \_\_\_\_\_ (**Large 60S smaller 40S**)
- Serin + palmitate = \_\_\_\_\_ **Sphingosine**
- Higher GC base pairs increases T<sub>m</sub>, because with three hydrogen bonds, require **More** heat energy
- Acid dissociation constant are designated as **PKa**
- The bond present between the double helix \_\_\_\_\_ **hydrogen bonds.**
- Which one of the following is made up of two glucose \_\_\_\_\_ **maltose**
- Maltose comprises two glucose molecule that join together by..... Glycoside linkage ( **alpha 1 to4** )
- Hemoglobin is excessively found in \_\_\_\_\_ **RED Blood cells**
- Titration curve of Glycine known as \_\_\_\_\_ **Diprotic form**
- The sign of enthalpy is \_\_\_\_\_ **ΔH**
- In a double-stranded nucleic acid, cytosine typically base pairs with **Guanine (C-G).**



# Zoology Legends

- Waxes are insoluble in \_\_\_\_\_ **Water**
- Measure of randomness system is \_\_\_\_\_ **Entropy**
- These enzymes catalyze condensation reaction joining two molecules by forming  $C^*O$   $C^*S$   $C^*N$   $C^*C$  bonds \_\_\_\_\_ **ligases.**
- Rancidity occur by \_\_\_\_\_ **Oxidation**
- Globosides are highly abundant in \_\_\_\_\_ **RBCs**
- **(very low density lipo proteins)**
- VLDLs composed predominantly of **TAGs**
- Ethanolamine is a primary \_\_\_\_\_ **alcohol and a primary amine.**
- Negative charge on DNA is due to \_\_\_\_\_ **Phosphate**
- RNA refers to \_\_\_\_\_ **Ribonucleic Acid.**
- At the 5' end of RNA, there is a free **Phosphate group.**
- The bond between DNA and RNA is a **Phosphodiester Bond.**
- Which one is halogen \_\_\_\_\_
- Halogen refers to elements like **Fluorine, Chlorine, Bromine, Iodine, and Astatine.**
- No. of carbon in steric acid is \_\_\_\_\_ **18**
- Ketokinase is involved in the metabolism of **Ketone Bodies**, not glucose.
- A **motif** also called a **super secondary structure**
- The smaller RNA is **tRNA (Transfer RNA).**
- Fruits contain **Fructose.**



# Zoology Legends

- The alpha helix is present in the **Secondary Structure** of proteins.
- Maltose **sunflower**-shaped
- Iodine number of cotton seed oil varies from **103 to 111**.
- That of olive oil from **79 to 88**,
- And that of linseed oil from **175 to 202**
- A commercial lot of olive oil which has iodine number higher than **88** might have been adulterated with cotton seed oil
- The enzyme for lactose to lactic acid conversion is **Lactase**.
- D-glucose has a **hydroxyl (OH)** group at the 5th carbon and an **aldehyde group** at the 1st carbon.
- **phosphatidylcholine** only in that ethanolamine or serine
- Ethanolamine has the structure **NH<sub>2</sub>-CH<sub>2</sub>-CH<sub>2</sub>-OH**.
- The complex folding of chromosomes is referred to as **Chromatin**.
- The complex folding of large chromosomes within eukaryotic chromatin and bacterial nucleoids is generally **considered tertiary structure**
- acid dissociation constant ....pka
- Weak Acids and Bases have Characteristic **Acid Dissociation** Constants
- Acid dissociation constant is represented as **pKa**.
- A nucleoside is formed by combining a **nitrogenous base with a sugar** molecule.



# Zoology Legends

- Nucleoside is.....**guanine + ribose**
- Double bond is present in.....**Thymine and adenine**
- pH is controlled by.....**buffer solution**
- Standard amino acids are the **20** common amino acids found in proteins.
- Fatty acids contain a hydrophobic **hydrocarbon tail and a carboxyl group.**
- A fatty acid consists of a **hydrophobic hydrocarbon** chain with a terminal carboxyl group that has a pKa of about **4.8**
- Complex structures of proteins are termed **Tertiary Structures.**
- Factors are determined by parameters like **Km, VMAX, or curve plots.**
- tRNA constitutes about **15-20%** of the total RNA content in a cell.
- Thymine and uracil differ by the presence of a **methyl group in thymine.**
- DNA denaturation is often monitored at **260 nm.**
- Water is **essential** for the living organisms.
- Purines (adenine and guanine) have **NH<sub>2</sub> groups.**
- The pKa value of glutamate is around **4.07.**
- Fumaric acid is converted to **Malic acid.**
- The Trans form of maleic acid is called\_\_\_\_\_.
- Fumaric**
- mRNA constitutes the **coding sequence** for proteins.



# Zoology Legends

- **Uric acid** is the catabolic end product of purines in human beings.
- Purines are converted into **uric acid**.
- In sickle cell anemias glutamate is replaced by **valine**
- VLDL test gives information about **lipid metabolism**.
- Aromatic non polar compounds\_ – **Phenylalanine – Tyrosine – Tryptophan**
- types of enzymes\_ **6**.
- enzymes are divided into **six** major classes
- Cytosine forms pair with **Guanine**.
- Two Bonds between **A and T**
- Three between **G and C**
- Waxes are in water\_ **Insoluble**
- Purines pyrimidine are **hydrophobic** in nature's
- Template strands are read in the **3' to 5' direction**.
- Competitive inhibitors resemble the **substrate** and compete for binding to the **active site** of the enzyme.
- Noncompetitive inhibitors **do not** bind at the active site
- Competitive inhibition shows a characteristic **Lineweaver-Burke plot**
- If the non-protein moiety is a metal ion such as  $Zn^{2+}$  or  $Fe^{2+}$  it is called a **cofactor**.
- **Cofactors** are inorganic ions or non-protein molecules necessary for enzyme activity.
- If it is a complex organic molecule or metallo-organic compound it is termed a **coenzyme**.



# Zoology Legends

- **Coenzymes** are small organic molecules that assist enzyme function.
- Iron is a **transition metal**
- an iron atom has a positive **two charge (ferrous ion)** instead of **three charge (ferric ion)**
- Iron serves as a **cofactor** in heme-containing proteins.
- The names of pyrimidines are **cytosine, thymine, and uracil.**
- The **order of reactions** refers to the sequence of **chemical events** in a process.
- Carbohydrates can be classified into **monosaccharides, disaccharides, and polysaccharides.**
- Aromatic amino acids are **phenylalanine, tryptophan, and tyrosine.**
- Halogens include fluorine, **chlorine, bromine, iodine, and astatine.**
- An amino acid that is negatively charged at physiological pH is **Aspartate (Asp) & Serine**
- Purines pair adenine with thymine (**A-T**) and guanine with cytosine (**G-C**).
- The first leukotriene discovered was **Leukotriene C. (WBCs Leucocytes)**
- Leukotrienes your name so because they were first discovered in (**white blood cells**)
- **INTRONS** is removed during RNA maturation?
- activators consist how many domains? **Multiple**
- what charge is on DNA? **NEGATIVE**



# Zoology Legends

- The mixture of DNA and proteins is called **Chromatin**.
- The point mutation in the DNA sequence result in the replacement of; **Glutamate residue with Valine** residue
- Protein mutation **involves changes** in base pairs.
- RAN refers to **Ribonucleic Acid**
- The pH of pepsin is around **2**
- Water is the most abundant substance in living systems, making up **70%** or more of the weight of most organisms
- **Enzyme inhibitors** are molecular agents that interfere with catalysis, slowing or halting enzymatic reactions.
- Any substance that can diminish the velocity of an enzyme-catalyzed reaction is called an **inhibitor**.
- which of the following enzyme inhibitors\_\_ **aspirin**
- The pKa value of lactic acid is around **3.9**.
- Substrate binds to the **active site** of the enzyme.
- TAGs containing saturated fatty acids are **solid at room temperature** such as **butter** whereas
- • TAGs containing unsaturated fatty acids are **liquid at room temperature** such as olive oil.(Olic acid, 18:1,9)
- Fats rich in **saturated** fatty acids have **low iodine numbers**,
- while fats rich in **unsaturated** fatty acids have **high iodine numbers**
- Saturated fatty acids contain **no** double bonds.



# Zoology Legends

- **Double bonds** in unsaturated fatty acids & the mammalian ribosomes contain which two major nucleoprotein subunit.
- **tRNA** is the smallest of the three major species of RNA (**4S**).
- The higher the content of GC base pairs, the **higher the melting point** of the DNA.
- which of the following only present in RNA\_\_ **Uracil**
- Both 5'-end and 3'-end are free. at 5'-end there is a **free phosphate**. at 3'-end there is a free OH
- The backbones of both DNA and RNA are **hydrophilic**.
- The ribosyl moieties are attached to the **nucleobases** by N-glycosidic bonds
- N-glycosidic bonds, have **Nitrogen atom instead of oxygen** linking the two residues.
- Sugars are linked to the **heterocycle** by a  $\beta$  -N-glycosidic bond, almost always to the **N-1 of a pyrimidine & N-9 of a purine 15**
- **Simple triglycerides**: Fatty acids connected to **glycerol** are of the same type e.g., **tripalmitin**.
- The Mediterranean diet is associated with **decreased serum** total cholesterol
- The deleterious effects of trans fats occur at intakes of **2 to 7 g/day**
- waxes are insoluble in\_\_\_ **Water**
- Glycerol is synthesized from **Dihydroxyacetone Phosphate** (an intermediate of the glycolytic pathway)



# Zoology Legends

- Glycerol can form **dihydroxyacetone phosphate** which can convert into glucose or glyceraldehyde phosphate to enter into gluconeogenic pathway.
- The **hsp70** family of chaperones binds short sequences of hydrophobic amino acids in newly synthesized polypeptides.
- Reducing disaccharides also give osazones **Maltose** sunflower-shaped
- Sunflower osazones are **Maltose** in nature.
- Pepsin is active at **pH 2**.
- The pka value of acetic acid is **4.76**.
- The beets sheets form the core of **globular proteins** .
- Leukotrienes are named because they was first identified in **white blood cells** .
- About **78%** of the amino acid residues in the **myoglobin** are found in  **$\alpha$  helices** with bends in between.
- Ethanolamine is a **primary alcohol and a primary amine**.
- Galactolipids constitute about **70% to 80 %** of plant membrane lipids.
- mRNA makes **2-5%** of cell.
- RNA referred as **\_\_Ribonucleic Acid**
- Galactose joined to glucose by **beta(1-4)**.
- Keratin is found **in hair, nail, hoofs**.
- Guanosine binds to **cytosine**.
- The pH is maintained by **buffer solution**



# Zoology Legends

- Reversible inhibitor **decrease** the value of **V<sub>max</sub>**.
- Reversible inhibitors typically bind to enzymes through **noncovalent bond**.
- The difference between the energy levels of the ground state and the transition state is the **activation energy**.
- What is wrong about Michaelis Menten equation\_ **The rate of the reaction is inversely proportional to the enzyme concentration.**
- Saturated fatty acids have double bonds. **Zero**
- The common name of omega-6 is **linoleic acid**.
  - The most important exceptions to Michaelis-Menten kinetics are the **regulatory enzymes**.
- In contrast to keratin, **myoglobin**, whose structure is also highly  $\alpha$ -helical, is a globular, flexible molecule
- glutamate has a pI of **3.22**
- In Sickle cell anemia a Glutamate residue is replaced by **Valine** at position **6 of beta** chain of Hemoglobin
- The R group of valine is neutral, whereas glutamate has a negative charge at **pH 7.4**
- pH of glutamate?\_ **pH 7.4**
- Seminal fluid is rich in **fructose** and sperm utilize fructose for energy
- Single stranded DNA has a..... Relative absorbance at **260nm** wavelength then double stranded DNA (**high**)
- which is the structural protein in following? **All of These (Collagen, Elastin, Keratin)**



# Zoology Legends

- leukotrienes are present in ? **Leucocytes (WBCs)**
- Value of palmitic acid? **16:0**
- The 16-carbon saturated palmitic acid is abbreviated\_ **(16:0)**
- Stearic Acid **(18:0)**
- Oleic acid **(18:1)**
- PI value of glycine?\_ **5.7**
- At any pH **below** its pI, glycine has a net **positive** charge and will move toward the *negative electrode (cathode)*
- At any pH **above** its pI, glycine will have a net **negative** charge and thus will move towards **the positive electrode (anode)**
- Which is formed when carbohydrates and proteins are together?\_ **Glycoprotein**
- which is the table sugar in following?\_ **Sucrose**
- Which one is present only in RNA...**Uracil.**
- waxes are insoluble in ....**water** .
- Which bases have triple bond .... **guanine and cytosine.**
- Instead of thymine which is present in RNA ...**Uracil.**
- The deleterious effect of trans fats occur at intake .. ...**2-7g/per day**
- Leukotrienes they were first discovered in .... **White blood cell**
- In protein there is "**peptide bond:**
- Atomic number of oxygen is '**8**'
- Chargaff rule: **A + G = T+ C.**



# Zoology Legends

- Phosphotidal choline is formed by "**sphingosine and choline**"
- Glycerophospholipids the alcohol is **glycerol**.
- Sphingophospholipids the alcohol is **sphingosine**.
- Histidine is **polar Amino acid**
- - Histidine, which has an **aromatic imidazole** group
- Arginine and Histidine side chains from the **hemoglobin**.
- Only histidine has an R group (**pKa = 6.0**)
- The pI of Histidine, with two groups that are positively charged when protonated, is **7.59**.
- Lysine is **hydrophilic**
- Furfural compounds are **RED** in Color
- Pentoses yield a cyclic aldehyde furfural with **12% HCL**
- Cholesterol is produced in "**liver**"
- When pH becomes equal to pka value
- the pI is simply the **arithmetic mean** of the two pKa values
- In water "**hydrogen bonding**" is significant character
- pH of pepsin **\_2**
- Symbol of aspartate **\_**
- A--- is a bio catalyst that increase the rate **\_ Enzymes**
- In the systematic naming system, enzymes are divided into **six major** classes each with numerous subgroups
- Molecular weight of water ---- **18**



# Zoology Legends

- The coordinated nitrogen atoms (which have an electron-donating character) help in preventing the conversion of the **heme iron to the ferric (Fe<sup>3+</sup>)** state
- Some small molecules, such as carbon monoxide (CO) and nitric oxide (NO), coordinate to heme iron with greater affinity than **does O<sub>2</sub>**.
- The proximal **histidine F8**, binds directly to the **iron of heme**
- because of **covalent bond** this histidine is closer to heme iron and named as **proximal histidine** (closer histidine),
- Myoglobin can bind **only one** molecule of oxygen.
- The oxygen dissociation curve for myoglobin has a **hyperbolic shape**
- Rinosaur horns made up of? **Protein (Keratin)**
- Purines include? **Adenine & Guanine**
- 1 torr = **1mmHg**
- Simple triglyceride? **tripalmitin**
- Name of omega 6? **Linoleic Acid**
- VLDLs composed of? **TAGs**
- A much stronger correlation exists between the levels of blood **LDL cholesterol** and heart disease.
- Waxes are not soluble in.....**Water**
- Carbon number of palmitic acid.....**16:0**
- Platelet aggregation is the culminating step in the cardiovascular diseases due to **atherosclerosis**.



# Zoology Legends

- There is a strong evidence that dietary intake of trans fatty acids (often referred to as "**trans fats**") leads to a higher incidence of cardio-vascular disease,
- cardiovascular disease and also to some extent for – **Alzheimer's disease**
- The enzyme condensation reaction joining two molecules C-O, C- S is called.....**Ligases**
- Iron is a transition.....**Metal**
- Iron is a **transition metal** & because its orbitals are so close energy wise they tend to give up either **2 or 3** electrons at time
- Super secondary structure of protein....**Motif**
- The genetic **master plan** is contained in the nucleotide sequence of **DNA**.
- It is through the ribonucleic acid (RNA)—the "**working copies**" of the (DNA) — that the master plan is expressed
- Sugar present in fruits (**fructose**)
- VLDL is predominantly composed of (**TAGs**)
- No of carbon in stearic acid (**18**)
- Michaelis-Menten equation, the rate equation proposed by **Leonor Michaelis and Maud Menten in 1913**
- The Michaelis-Menten equation is therefore consistent with the observed dependence of  **$V_0$  on  $[S]$** , and the shape of the curve is defined by the terms;  $V_{max}/K_m$  at low  $[S]$  and  $V_{max}$  at high  $[S]$ .



# Zoology Legends

- When  $[S]$  is much greater than  $K_m$  the velocity is **constant** and equal to  $V_{max}$ .
- The Michaelis-Menten equation can be algebraically transformed into **Lineweaver Burke plot**, a Double Reciprocal Plot, that is useful in the practical determination of  **$K_m$  and  $V_{max}$**
- Which can only be approximated from a simple plot of  **$V_o$  versus  $[S]$** .
- Table Sugar is?\_ **Sucrose**
- Amino acids most commonly found in **alpha helices** are non-polar with aliphatic side chains
- Fatty acids are aliphatic carboxylic acids with **hydrocarbon chains**.
- A Nonpolar, Aliphatic R Groups are **hydrophobic**
- Entropy is a measure of the **randomness or disorder** in a system.
- Entropy of a system always **tend to increase** to a maximum value.
- $P_{50}$  is approximately **1 mm Hg** for myoglobin and **26.6mm Hg** for hemoglobin
- **Eicosa-tri-enoic acid (ETA)** have **3 double bonds**
- **Arachidonic acid** have **4 double bonds**
- **Eicosa-pentaenoic acid (EPA)** have **5 double bonds**
- The base pairs are held together by **hydrogen bonds**
  - Two Bonds between **A and T**
  - Three Bonds between **G and C**
- **Nucleotides / Nucleosides** are composed of



# Zoology Legends

- A **nitrogenous base** (purine or pyrimidine)
  - A **pentose monosaccharide**
  - One, two, or three **phosphate groups**
- \*simple triglycerides is? **tripalmitin**
- \*No. Of carbon atom in chain fatty acids?
- Short Chain Fatty Acids (**2-4 C**)
- Medium Chain Fatty Acids (**6-12 C**)
- Long Chain Fatty Acids (**14-18 C**)
- Very Long Chain Fatty Acids (**18 and more C**)
- **Arachidonic** acid is synthesized from both **Linoleic acid** and **alpha-Linolenic** acid.
- cholesterol is? **Esters**
- RNA have which base? **Uracil**
- Ribosome **60S and 40S**
- No. Of carbon atom is stearic acid? (**18:0**)
- tRNAs compose roughly **20%** of total cellular RNA
- Backbone of DNA is .. **hydrophilic**
- Which of the following is purine\_ **Adenine (A), Guanine (G)**
- The free group attached at the 3' end of nucleotides is the 3' **Hydroxyl (OH) group**
- Nitrogenous bases are paired with **hydrogen bond**
- The difference in energy levels between the transition and ground states is **Activation Energy**.



# Zoology Legends

- **Hexokinase catalyses** the first step in glucose metabolism in most cells, the transfer of a phosphate from ATP to glucose to form **glucose 6-phosphate**.
- Plot between initial velocity and substrate concentration is ...**hyperbola**
- An example of a tetrose is **Erythrose**.
- The protein concentration in HDL (High-Density Lipoprotein) is around **55%**.
- In sickle cell anemia, **Glutamic Acid** is replaced by Valine.
- The composition of tRNA includes a **D-arm, T-arm, and Anticodon Loop**.
- The Line-Weaver Burk plot is derived for the **Michaelis-Menten reaction**.
- An example of a disaccharide is **Sucrose**.
- Alanine is in its isoelectric form at a pH **of 6**.
- Two sulfur-containing amino acids are **Methionine and Cysteine**.
- **Arginine** has a positively charged guanidinium group.
- The secondary structure of a protein is defined by the arrangement of its amino acid residues in local segments like **alpha helices and beta sheets**.
- Hemoglobin is a...**tetramer**
- Sialic acid gives gangliosides a negative charge at **pH around 7**.
- Base pairs are held together by **Hydrogen Bonds**.



# Zoology Legends

- In Bohr's effect, the binding of  $H^+$  and  $CO_2$  is inversely related to the binding of **Oxygen ( $O_2$ )**.
- The standard amino acid that, upon decarboxylation, produces Ethanolamine is **Serine**.
- Enzymes are divided into **Six classes** in a systematic naming system.
- Enzyme activity can also be characterized through **pH and temperature**.
- $K_w$  value of water at  $25^\circ C$  \_\_\_?  **$1 \times 10^{-14} M^2$**
- **Homopolysaccharides (homoglycans)**: Polymers of same monosaccharide units e.g. **starch, glycogen, inulin, cellulose, dextrans, dextrans**
- **Heteropolysaccharides (heteroglycans)**: Polymer of different monosaccharide units or their derivatives e.g. **Mucopolysaccharides, (glycosaminoglycans)**
- Glucuronic acid is formed by the oxydation of glucose at \_\_\_? **C-1**
- $pK_2$  value for alanine \_\_\_? **2.34**
- which of the following shows the greatest tendency to form @halix in most EMS \_\_\_? **Tryptophan**
- Hemoglobin consist of \_\_\_ Subunits? **Four**
- **Purines** have a **double-ring structure**.
- Glycerol is converted to L-glycerol-3-phosphate by **Glycerol Kinase**.
- saturated lipids increase \_\_\_ level in blood? **Increase**



# Zoology Legends

- The curve obtained when plotting initial velocity ( $v^{\circ}$ ) against substrate concentration is called the **Michaelis-Menten curve**.
- **Irreversible inhibitors** bind to enzymes through **covalent bonds**.
- **Reversible inhibitors** typically bind to enzymes through **noncovalent bonds**
- Glucose and Mannose are epimers with respect to the **Carbon-2 position**.
- atomic number of oxygen -----?? **8**
- the  $pK_2$  of glycine is -----?? **2.34**
- **Peptide bond** is linkage between two amino acid .
- Misfolding of proteins may occur **spontaneously** or caused by a mutation in a particular gene, producing an altered protein.
- the chief constituents of bees waxes is -----  
**Triacontanol** ,also known as melissyl alcohol or myricyl alcohol.
- ADP contain ----- phosphate group ? **Two**
- Hb has a hybrid **S-shaped, or sigmoid**, binding curve for  $O_2$
- In nature, DNA exists as a **double-stranded helix**.
- Rancidity is caused by **oxidative reactions**.
- One letter symbol of glycine\_\_ **G**
- Hemoglobin is a **tetramer**
- Omega-6 fatty acids are present in **sunflower oil**.



# Zoology Legends

- Symbol of aspartate...**D**
- The difference between thymine and uracil is the presence of a **methyl group in thymine**.
- Pyrimidine bases are **cytosine, thymine, and uracil**.
- Measure of randomness system is..**Entropy**
- The optimum temperature of pepsin is around **37°C (body temperature)**.
- RAN refers to **Ribonucleic Acid**.
- The pH of Pepsin is around **2**.
- water making up\_\_ weigh of most organisms\_ **70%**
- which of the following enzyme inhibitors\_\_ **aspirin**
- pka of lactic acid is **3.9**
- The mammalian ribosomes contain the **large and small** nucleoprotein subunits.
- A higher GC content leads to a **higher melting** point of DNA.
  
- The backbone of both DNA and RNA is composed of **sugar-phosphate units and is hydrophilic**.
- N-glycosidic bond refers to the bond between the **nitrogenous base and the sugar molecule** in nucleotides.
  
- Two molecule sugar present in (**Maltose** )



# Zooology Legends

- Bonds between cytosine and guanine( **three Hydrogen bonds**)
- Cholesterol is primarily produced by the **liver**.
- Sunflower seeds contain high levels of **Omega-6 fatty acids**.
- An example of a polysaccharide is **Starch or Cellulose**.
- A molecule with only one chiral carbon can have **two stereoisomers**
- Myoglobin bound **one** molecule of O<sub>2</sub>.
- Atomic number of nitrogen? **7**
- the addition of reduced glutathione to carbon **6 forms LTC<sub>4</sub>**
- **LDL (Low-Density Lipoprotein)** cholesterol levels have been associated with a decreased heart rate.
- Triacylglycerol are soluble in.....**ether, benzene,**
- VLDLs composed predominantly of **TAGs**
- These enzymes catalyze condensation reactions joining two molecules by forming C-O, C-S, C-N and C-C bonds.....**ligases**
- Waxes show **negative test**.



# Zoology Legends

- Example of purines... **Guanine**.
- D -glucosamine, a constituent of **hyaluronic acid**
- D -galactosamine (also known as chondrosamine), a constituent of chondroitin – **D -mannosamine**
- **Rancidity**: The chemical deterioration of **fats**.
- **Effect on Vmax**: The effect of a competitive inhibitor is **reversed by increasing [S]**
- Double bonds are present in **unsaturated fatty acids**.
- The mammalian ribosome consists of a **large subunit (60S) and a small subunit (40S)**.
- If it is a complex organic molecule or metallo-organic compound it is termed a **coenzyme**.
- Sugar present in DNA? **deoxyribose**
- The pKa value of acetic acid is? **4.76**
- Example of purine is **guanine**
- The secondary structure found in proteins is the **alpha helix and beta sheet**.
- The constituent of chondroitin is **D-mannosamine**
- The arrangement of these protein subunits in three-dimensional complexes constitutes **quaternary structure**.
- The interaction of enzymes with each other forms the **quaternary structure**
- Triglycerides (tryglycerides) are insoluble **in water**.



# Zoology Legends

- The Michaelis-Menten equation describes the relationship between **substrate concentration and enzyme activity**.
- Hemoglobin is found in **red blood cells (RBCs)**.
- *Halogens are found in **Group 17 (VIIA)** of the periodic table.*
- The amino acid that is negatively charged at physiological pH is **aspartate**.
- Serine + palmitate = **sphingolipids**
- DNA contains four bases: **adenine (A), thymine (T), cytosine (C), and guanine (G)**.
- **lactose** powder puff shaped
- DNA Denaturation can be monitored by measuring its absorbance at **260 nm**
- Weak Acids and Bases have Characteristic **Acid Dissociation Constants**
- Equilibrium constants for ionization reactions are usually called **ionization constants** or acid dissociation constants, often **designated pKa**
- pH is controlled by.....**buffer solution**
- **Serine** is a standard amino acid
- A fatty acid consists of a **hydrophobic hydrocarbon** chain with a terminal carboxyl group that has a pKa of about 4.8
- Complex structures....**tertiary**
- Thymine and uracil differ in ....**methyl group**



# Zoology Legends

- In sickle cell anaemia, Glutamate is replaced with \_\_\_.  
**valine**
- Acid dissociation constants are designated as \_\_\_. **PKa**
- Glucose residues in amylose are linked by \_\_\_. **α (1,4) linkage**
- light produced by fireflies this reaction is catalyzed by.....  
**luciferase**
- Negative R groups in amino acids include those  
**containing acidic** functional groups.
- Halogens are a group of elements that include **fluorine, chlorine, bromine, iodine, and astatine.**
- In DNA, cytosine is around **18%** and adenine is also around **18%**.
- Chylomicrons are **lipoprotein** particles that transport dietary lipids.
- 13.phosphatidylcholine is formed from....**Choline + PA (Phosphatidic acid)**
- **Phosphatidylcholine** is formed from **choline and phosphatidic acid.**
- Leukocytes are named due to their function as **white blood cells** that protect against infections.
- Cholesterol is the **major sterol** in animal tissues
- Cholesterol is an **amphipathic** lipid
- Cholesterol is a **structural component of** all cell membranes, modulating their fluidity
- Cholesterol is a precursor of **bile acids** steroid hormones  
**vitamin D**



# Zoology Legends

- pKa of the  $\text{-COOH}$  group in the range of **1.8 to 2.4**
- pKa of the  $\text{-NH}_3^+$  group in the range of **8.8 to 11**
- Serine + palmitate = **sphingolipids**.
- **Maltose** is made up of two glucose molecules.
- The titration curve of glycine is known as the **titration curve of an amino acid**.
- Ethanolamine is a **primary amino alcohol**.
- **aldotetroses and all monosaccharides** with five or more carbon atoms in the backbone occur predominantly as **cyclic (ring) structures**.
- All the monosaccharides except dihydroxyacetone contain one or more **asymmetric**
- Benedict's reaction: The cuprous ion ( $\text{Cu}^+$ ) produced forms a **red cuprous oxide precipitate**
- **Homopolysaccharides** contain **only a single** monomeric species
- **Heteropolysaccharides** contain **two or more** different kinds
- Simple **triglycerides**: Fatty acids connected to glycerol are of the same type • e.g., **tripalmitin**.
- Most of the hexoses of living organisms are **D isomers**
- For example, the naturally occurring form of **fructose** is the **D(-) isomer**
- Most are not digested by human enzymes  
**oligosaccharides**
- The ***hsp60*** family of chaperones, sometimes called **chaperonins**



# Zoology Legends

- carbohydrate and lipid components Like the **phospholipid sphingomyelin**
- For example, D-glucose exists in solution as an intramolecular hemiacetal in which the free hydroxyl group at C-5 has reacted with the **aldehydic C-1**,
- Glucose 6 Phosphate is formed by the addition of phosphate group to C6 of glucose by **\_ linkage. Ester**
- Which one of the following proteins stores iron? **\_ferritin**
- Rhinoceros horn is made up of **Keratin**
- In glycine, the R group is another **hydrogen atom**
- The suffix 'ine' in cytosine and adenine indicates the presence of **nitrogen (amine)** in the ring.
- DNA absorb ultraviolet light due to its absorption **by nucleotides** that results in chemical modifications in DNA.
- The **conjugated double bonds** of purine and pyrimidine derivatives absorb ultraviolet light.
- Iodine number of olive oil ranges from **\_79 to 88,**
- **high levels of HDL cholesterol** have been associated with a decreased risk for heart disease
- Phosphatidylcholine is formed from **\_ Choline + PA**
- 
- When initial velocity ( $V_0$ ) is plotted against  $[S]$ , the curve obtained is called as: **hyperbolic curve results,**
- Platelet aggregation is the culminating step in the cardiovascular diseases due to: **atherosclerosis.**



# Zoology Legends

- Imbalance of omega-6 and omega-3 PUFAs in the diet is associated with? **an increased risk of cardiovascular disease.**
- Sugar phosphates are relatively stable at pH.
- DNA absorbs ultraviolet light at a wavelength of around **260 nm.**
- Adjacent nucleotides in DNA are joined by a **phosphodiester bond.**
- If cytosine is 18% in a DNA molecule, then adenine would also be approximately **32%** (since adenine pairs with thymine in DNA and their percentages should sum to 100% together).
- RNA is referred to as **ribonucleic acid.**
- 6-N-Methyllysine is constituent of contractile protein\_ **myosin**
- A simple monoamino monocarboxylic - amino acid, such as alanine, is a **diprotic acid** when fully protonated
- Hemoglobin is a **tetramer**
- The deleterious effect of trans fat occur at intake **of 2 to 7 g/day**
- Ethanolamine **a primary alcohol and a primary amine**
- Sialic acid gives gangliosides the negative charge at PH? **7**
- At which pH denaturation of a double helical RNA occurs? **temperatures 20 C or more high**
- Enzymes are capable of recognizing and reacting with a special chemical substance called



# Zoology Legends

- The reaction reaches equilibrium much faster because
- For example, **pepsin**, a **digestive enzyme in the stomach**, is maximally active at pH 2.
- Enzymes are capable of recognizing and reacting with a special chemical substance **called substrate**.
- The reaction reaches equilibrium much faster when the appropriate enzyme is present, **because the rate of the reaction is increased**.
- A higher numerical value of the Michaelis constant ( $K_m$ ) indicates a higher enzyme/transporter affinity for its **Substrate**
- Competitive inhibition shows Lineweaver-Burk plot  
Competitive inhibition shows a **characteristic Lineweaver-Burke plot**
- $pK_a$  of Acetic acid is **4.76**
- Sunflower osazones are **Maltose** in nature
- What is wrong about Michaelis Menten equation? Ans.  
**The rate of the reaction is inversely proportional to the enzyme concentration.**
- RNA referred as **working copies of DNA**
- Reversible inhibitors typically bind to enzymes through **noncovalent bond**.
- The mammalian ribosomes contains two major nucleoproteins subunit **(Large 60S smaller 40S)**
- Constituent of chondroitin- **D -mannosamine**
- $pK_a$  value of histidine: **6.0**



# Zoology Legends

- Reversible inhibitors bind to enzymes through: **Non-covalent interactions.**
- Hemiacetals are derivatives of: **Aldehydes** or Ketones
- Aromatic amino acid: Phenylalanine, Tyrosine, Tryptophan.
- Carbon number in lysine: **6 carbon atoms.**
- Cholesterol is: **Amphiphilic.**
- The double helix of RNA denatured in: Acidic, basic, or neutral conditions, depending on the specific RNA sequence and conditions.
- Bile is a fluid that is made and released by the liver and stored in the **gallbladder**

## Quiz MID Term Spring 2023

- Maleic acid have (**Double Bonds**)
- It is metabolized to glucose; one gram of GDL yields roughly the same amount of metabolic energy as (**one gram**) of sugar.
- When glucose is kept in alkaline solution for several hours, it undergoes isomerization to form (**D-fructose and D mannose**).
- Atomic number of Nitrogen is (**7**)
- Glycosidic bond of maltose is formed between the OH **of (carbon 1 and carbon 4)** of 2nd glucose monomers. Therefore, it forms an alpha (**1- 4**) glycosidic bond.



# Zoology Legends

- **(Entropy)** is a measure of the randomness or disorder in a system
- **(Proline)** residue introduces a destabilizing kink in an  $\alpha$  helix
- Amino acids A. Aliphatic R groups is **(Proline)**
- The major hemoglobin in adults is **(Hemoglobin A)**.
- This adjustment in the BPG level has **(only a small effect)** on the binding of oxygen in the lungs
- **(carbon 5 in glucose)** determines whether the sugar belongs to the D or L series
- Glucose and Galactose are an example of an epimeric pair which differ only with respect to **(C4)**
- **(Eicosanoids)** exert complex control over many bodily systems; in inflammation immunity, and as messengers in the central nervous system.
- **(Primary systemic amyloidosis)** is caused by deposition of fibrils consisting of misfolded **(immunoglobulin)** light chain
- Well-defined structures of proteins is **(Tertiary Structure)**
- The amide group of asparagine serves as the site of attachment for an oligosaccharide chain in a glycoprotein... **serine**
- The salt that is water-soluble is...**potassium (K)**.
- The partial pressure of oxygen needed to achieve half saturation of the binding sites is called **p50**.
- Hemoglobin is present in **red blood cells**.



# Zoology Legends

- Immunoglobulins are **proteins** in nature.
- Lauric acid, the saturated fatty acid, has **12** carbon chains.
- Okazaki fragments have **DNA Ligase** Enzyme
- What is the common hemoglobin?
  - Answer: **HbA**
- What is the pressure of oxygen?
  - Answer: **30 mmHg**
- What is a common example of a monosaccharide?
  - Answer: **glucose**
- Which of the following is a polysaccharide?
  - Answer: **Starch**
- What is sickle cell anemia?
  - Answer: a **genetic disorder**
- What is the pKa value of histidine?
  - Answer: **6.0**
- What is the pKa value of acetic acid?
  - Answer: **4.76**
- Hemoglobin is a tetra...
  - Answer: **four subunits**
- What is the amount of CO<sub>2</sub> in bicarbonate?
  - Answer: **80 to 85%**
- What are the domains of protein structure?
  - Answer: **Primary, secondary, tertiary, and quaternary**



# Zoology Legends

- Cooperative binding of oxygen refers to the binding of oxygen molecules to **one subunit** of a protein influencing the binding of oxygen to other subunits.
- Are Na and K soluble in water?
  - Answer: **Yes**
- What causes protein misfolding?
  - Answer: **Genetic mutations, environmental conditions, or protein imbalances.**
- What is the partial pressure of oxygen in the lungs?
  - Answer: **30 mmHg**
- Glutamate residue is replaced by?
  - Answer: **Valine**
- About ... of the amino acid residues in the myoglobin are found in a helices with bends in between?
  - Answer: **78%**
- What is the pK value of glutamate?
  - Answer: **3.22**
- Is sucrose a reducing sugar?
  - Answer: **No**, sucrose is a non-reducing sugar.
- What is the pKa value of alanine?
  - Answer: **5.7**
- DNA have sugar?
  - Answer: **Deoxyribose.**
- The reappearing process of DNA is called...
  - Answer: **DNA replication**
- A (-PO<sub>3</sub><sup>2-</sup>) from ATP is transferred to an alcohol forming...



# Zoology Legends

- Answer: **phosphorylation**
- What is the end product of glycolysis?
  - Option: **Pyruvate**
- In the submersion process, organisms grow in which medium?
  - Option:
- What is the structure of tRNA?
  - Option: **Cloverleaf-shaped structure**
- The synthesis process of glucose is called...
  - Option: **Gluconeogenesis**
- What type of hemoglobin do humans have?
  - Option: **HbA**
- Is histidine polar or non-polar?
  - Option: **polar**
- Mono Amino mono-carboxylic Amino Acid is **Cysteine**
- Hydroxyl group of **serine and threonine** serve the site attachment for Oligosaccharides.
- Which Amino acid in Beta Turn
  - The designation of a sugar isomer as the D form or as the L form **carbon 5<sup>th</sup>** in glucose.
- PK2 value of glycine **9.60**
- Which Acetic acid acts Both glycogenic / ketogenic...  
**Lysine / leucine**
- Myoglobin have have **single peptide** Chain
- Enzymes which catalytic / Shuffling is... **Protein disulfide isomerase (PDI).**
- Na and K are **H<sub>2</sub>O (Water)** Soluble.



# Zoology Legends

- **Increasing** the affinity of the Hb for the further O<sub>2</sub> addition.
- When strenuous exercise lowers the **pO<sub>2</sub>** of muscle tissue to about **5 mm Hg**, myoglobin releases O<sub>2</sub> for mitochondrial synthesis of ATP, permitting continued muscular activity.
- The remainder of the CO<sub>2</sub> is transported as dissolved HCO<sub>3</sub><sup>-</sup> (**80 to 85%**)
- As in **sickle cell anemia** to deletion of a larger portion of the **polypeptide chain** (as in most cases of Duchenne muscular dystrophy)
- **Maltose** sunflower-shaped
- Thus glucose, fructose and mannose give the same type (**needle-shaped**) **osazones**.
- Which one is non- polar Aliphatic **proline**
- Nonpolar, **Aliphatic R Groups** includes, Glycine, Alanine, Proline, Valine, Leucine, Isoleucine, Methionine
- Structure of hemoglobin is ? **Tetramal**
- Iron is? **transition metal**
- Sure! Here are the answers to the multiple-choice questions (MCQs) you provided:
- Different compositions of carbohydrate (**oligosaccharide chains**) in different antigens.
- These oligosaccharides are attached to proteins through a **serine or threonine** residue or to ceramide lipid intermediate



# Zoology Legends

- Palmitic acid is a saturated fatty acid and contains **16 carbon atoms**.
- In sickle cell anemia, methionine is replaced by **valine** in the beta-globin chain of hemoglobin.
- The intermediate of glycolysis is called **glyceraldehyde-3-phosphate**.
- Podé puff osazones are given by **reducing sugars** such as glucose and fructose.
- The symbol for tyrosine is **Tyr**.
- E. coli converts lactose to lactate by the enzyme lactate **dehydrogenase**.
- Myosin includes the amino acid called **leucine**.
- Leucine, isoleucine, and tyrosine are amino acids that contain a **heterocyclic R group**.
- The pKa of alanine is approximately **2.34**
- **Histidine** is an amino acid that contains an **aromatic imidazole** group.
- An example of a contractile protein is **actin**.
- Immunoglobulins (antibodies) contain **four protein chains**: two heavy chains and two light chains.
- Stereoisomers that are mirror images of each other are called....**enantiomers**
- Glucose and Galactose are an example of an epimoric pair which differ only with respect to..... **C4**
- Example of hemopolysacchrides ? **Starch**
- Hemoglobin consist of ? **Two alpha & two beta chains**
- Classification of protein? **All options**



# Zoology Legends

- Naturally occurring isomers ? **L- isomers**
- Maltose consist of which molecules? **Two**
- Furfural compounds have sugar? **Pentose**
- protein examples? **All**
- Concentration in lungs and tissues? **High low**
- Value can be denoted by ? **pKa**



**ZOOLOGY**  
LEGENDS



# Zooology Legends

## Repeated Questions Spring 2023

### Short Questions:

- Define the medical properties of nucleotides and nucleic acids.
- Define Immuglobin, conjugated proteins, and complex protein.
- Write the Michaelis-Menten equation.
- Distribution of waxes in nature.
- Three pyrimidine bases.
- Difference between enantiomers and stereoisomers.
- Three functional groups of purines and pyrimidines.
- Three steps involved in catalytic enzymatic reaction.
- Define zero-order reaction.
- What are globosides?
- What is the Mediterranean diet?
- Components of a nucleotide.
- Name three unusual bases or modified bases.
- Three examples of polyunsaturated fatty acids.



# Zoology Legends

- What is sterol? Provide an example.
- Concentration of  $[\text{OH}^-]$  in a solution of 0.1 M NaOH.
- How do fireflies produce light?

## Long Questions:

- Properties of Triacylglycerol.
- Physical properties of cyclic AMP.
- How are proteins classified based on what basis?
- What information can be obtained from a titration of the glycine curve?
- Hydrogenation with respect to fats.
- Properties of nitrogenous bases.
- Effect of pH on the ionization of the active site.
- Describe the beta conformation in proteins.
- Describe the hydrogen bond in DNA.
- Induced fit hypothesis.
- Medical applications of nucleotides and nucleic acids.
- Components of inorganic cofactors.



# Zoology Legends

- Properties of palmitic acid.
- Properties of waxes.
- Describe the properties of nucleic acids.
- Define and explain rancidity.
- Reaction velocity.
- What is the Mediterranean diet and its health benefits?
- Explain the role of hydrogen ions ( $H^+$ ) in a solution of 0.1 M NaOH.
- Describe how fireflies produce light.

**ZOOLOGY**  
LEGENDS



# **Zoology Legends**

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**Remember me in you Precious Prayer**

**Jazak Allah**