Plus One Zoology Chapter Wise Questions and Answers

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Plus One Zoology Chapter Wise Questions and Answers: Chapter 1 THE LIVING WORLD

What is biology?

Definition of Biology: The science of life or living matter in all its forms and phenomena, especially with reference to origin, growth, reproduction, structure, and behavior.

Define biodiversity.

Biodiversity is a range of diversity among the living species in different kind of Earth ecosystems.

What is taxonomy?

Taxonomy is that branch of the science of classification which deals with classifying, identifying and naming living organisms into groups.

Who is known as the father of taxonomy?

Carolus Linnaeus is the father of taxonomy.

What is binomial nomenclature?

The process of naming organisms is called Binomial nomenclature which mean two names i.e., genus and species.

Define species.

A species is a set of individuals that possess common attributes which are capable of mating and producing viable offspring.

What is the taxonomic hierarchy?

Taxonomic hierarchy is a system of classification by which species are grouped with other species according to their genealogy, and it consists of seven important categories: Kingdom, Phylum, Class, Order, Family, Genus and Species.

What is the scientific name of humans?

Humans belong in the scientific type known as Homo sapiens.

What is the highest taxonomic rank?

At the most general level, the highest taxon is Kingdom.

Name the five kingdoms in the five-kingdom classification system.

The five kingdoms are Monera, Protista, Fungi, Plantae and Animalia.

Who proposed the five-kingdom classification?

R.H. Whittaker in 1969 introduced a five-kingdom system of classification of living organisms based on the mode of nutrition available and also how to the nutrients obtained by these organisms.

Define metabolism.

Metabolism is the sum of all biological processes needed to maintain an organism alive.

What is homeostasis?

Homeostasis: The uniform and balance in the internal mechanism (of the body) that helps an organism to withstand various stimulations

Differentiate between prokaryotic and eukaryotic cells.

Eukaryotic vs Prokaryotic Cells The most basic division in the living world is between cells of prokaryotes and eukaryotes; for instance, plants and animals.

What is the basis of classification in taxonomy?

Classification is strictly based on similarities and differences in morphology, anatomy, genetics & biochemistry.

What are the major characteristics of living organisms?

Attributes Growth, reproduction, metabolism. They can respond to stimuli like light etc Homeostatis

What is growth?

Growth is simply an increase in the size and cell number in an exisiting organism.

Explain reproduction.

Reproduction is the fundamentally biological process by which new individual organisms are produced.

What is the role of taxonomy in biology?

Taxonomy provides the systematic identification and classification of living things, simplifying biological studies.

Define nomenclature.

Nomenclature is the set of rules concerning how organisms are named and categorised.

What is an herbarium?

An herbarium is a collection of plants for scientific study.

What is the function of a botanical garden?

A botanical garden is a controlled and staffed institution for the maintenance of a living collection of plants under scientific management for purposes of education and research, together with such libraries, herbaria, museums.

What is a key in taxonomy?

A key is an instrument to recognize organism on the basis of character.

What is a museum in biological terms?

Museum: a building (or institution) in which objects of historical, scientific, artistic are kept and exhibited.

What are the rules of binomial nomenclature?

The genus name begins with a capital letter, and the species epithet is with a lowercase letter. They both have to be in italics, or underlined.

Define taxon.

A taxon is any level in the structure of biological classification, such as a species, genus or family.

What is systematics?

Systematics is the science of biological classification and evolutionary relationships between organisms.

Define flora and fauna.

Flora pertains to the plant life in a specific region whereas fauna refers the animals.

What is excretion?

Excretion is the process of organisms removing metabolic waste products from their bodies.

What is respiration?

Energy is released when organisms break down food in a biochemical process called respiration.

What is consciousness in living organisms?

The consciousness is typically defined as the higher order brain function of humans which arises from an animals ability to register and thereby experience changes in its environment, and respond accordingly.

What are living fossils?

Living fossils: an organism that has persisted without significant change for millions of years, e.g., the coelacanth;

What are viruses? Are they living?

Viruses, acellular organic particles capable of replication(doubling its size) only inside the living cells of other plants or animals. They are not live entities.

What is a biological classification system?

Biological classification, as of 2020 Some standards for a biological classification system Identification and Classification are different issues.

Name the tool used for taxonomic studies.

Tools : Keys, herbarium, museums and botanical gardens

Define biodiversity hotspots.

Hotspots are most notable for being rich in a variety of plant species and some degree of endemism, but have experienced serious consequences from human activities.

What is the ICZN?

The International Code of Zoological Nomenclature (ICZN) determines how animals are named.

Define phylogeny.

Phylogeny is the study of the evolutionary history and relationships among species.

What is genetic diversity?

From a population level, genetic diversity means the amount of gene variation inside a species.

What is a biosphere?

The biosphere is the worldwide sum of all ecosystems and consists of all living beings together with their relationships.

Define ecology.

Thrash-up with the environment and species:It deals with the interaction of an organism between their environment.

What is an ecosystem?

Ecosystem: A community of biological organisms plus their physical environment interacting as a unit

What is species richness?

Species richness describes the number of species in an area.

What is nomenclature based on?

Naming is governed by rules defined for use international codes, e.g. ICZN for animals.

What is the difference between flora and vegetation?

Flora represents the individual plant species, while vegetation is synonymous with the plant life of a place taken collectively.

What is the difference between flora and vegetation?

Living things are called autotrophs if they produce their own food. That can be by photosynthesis or chemosynthesis.

What are autotrophs?

Living things are called autotrophs if they produce their own food. That can be by photosynthesis or chemosynthesis.

Define heterotrophs.

Heterotrophs : Feed on other organisms

What is the difference between endemic and exotic species?

Exotic species are those not naturally occurring in the region whereas endemic species are native to a particular area.

What is meant by the term classification?

Classification of organisms is the methodological arrangement of living things into groups by similarities and differences.

What is the goal of biological classification?

Its objective is to identify and arrange living organisms in a system of classification that significantly demonstrates their relationships and evolution.

Plus One Zoology Chapter Wise Questions and Answers: Chapter-2 ANIMAL KINGDOM

What is the basis of classification in the animal kingdom?

Organization of body, symmetry, coelom, segmentation and notochord.

What distinguishes diploblastic from triploblastic animals?

Diploblastic are animals having two germ layers that is ectoderm and endoderm; triploblastic as animals having three germ layers like ectoderm, mesoderm, and endoderm.

Define cephalization.

Nerve tissues and Cephalization of sensory organs in the anterior end(head) of an organism.

What is metamerism?

The body segmentation into a set of repeating segments.

Name an example of asymmetrical animals.

Sponges (Phylum Porifera).

What are pseudocoelomates?

A pseudocoelomate animal has a body cavity that is not completely lined by mesoderm (e. g., Nematodes).

How is radial symmetry different from bilateral symmetry?

Radial symmetry is the arrangement of body parts around a central axis (e.g., Cnidarians) and Bilateral symmetry divides the body into two equal halves (e.g., Platyhelminthes).

What is the difference between open and closed circulatory systems?

Closed- blood flows inside vessels, open blood flows freely in body cavities.

Which phylum has the highest species diversity?

Arthropoda shows the highest species diversity.

What are hemichordates? Give an example.

Hemichordates — Marine animals that have aspects of both vertebrates and invertebrates (Balanoglossus)

Plus One Zoology Chapter Wise Questions and Answers: Chapter-3 Structural Organisation in Animals

What is the significance of choanocytes in sponges?

They support in water movement and filter feeding.

Define polymorphism in cnidarians.

A phenomenon where a species has two or more morphs (e.g. polyp and medusa) within it.

What is the role of nematocysts in cnidarians?

To defend against predators and to capture prey by nematocysts, which in turn Are stinging cells.

How do flatworms (Platyhelminthes) excrete waste?

Through flame cells.

What is the main difference between annelids and arthropods?

Segmented body with a true coelom (Annelids) EXOskeleton and jointed appendages (Arthropods)

What are the special features of echinoderms?

Their mobility is due to water vascular system and tube feet.

How do cephalopods like squids differ from other molluscs?

Their well-developed circulatory system is of the closed type and precisely controlled; they also have a complex nervous system.

What is the difference between agnatha and gnathostomata?

Vertebrates can further be divided into Agnatha (jawless vertebrates) like lampreys and Gnathostomata (vertebrates with jaws), e.g.; fishes etc.

What adaptation allows reptiles to live fully on land?

Because reptiles are designed for life on land, they have waterproof skin and lay shelled eggs that insulate the exquisite embryo within them from drying out.

What are marsupials? Give an example.

Marsupials are the mammals which carry their young ones in a pouch and nurse them(eg: Kangaroo).

How do tunicates and lancelets differ?

Tunicates resorb their notochord and nerve cord during metamorphosis, lancelets never do.

Which phylum is also known as flatworms?

Platyhelminthes.

Which phylum has organisms with a complete digestive system?

Nematoda (roundworms).

What is a radula, and which organisms have it?

Feeding organ in molluscs that grinds the food

What is torsion in gastropods?

The curving of the body, its resultant inversion causing full exposion to the anal aperture: an anus positioned above the neck.

What are setae in annelids?

Cilia – are hair-like structures with the purpose of movement.

What is a hydrostatic skeleton, and which phyla use it?

A liquid-filled body cavity for the purpose of holding organs; seen in cnidarians, nematodes, and annelids.

What is viviparity?

Live birth (ovoviviparity) instead of egg laying

What is countercurrent exchange in fishes?

Counter-current flow system is the presence of water moving in opposite direction to blood stream within the gills maximize uptake of Oxygen.

What are placoid scales, and which animals have them?

The scales that are tooth-like in appearance, and so-called from this first one known to science in a cartilaginous fish; e.g. shark.

What are amniotes?

Eggs with an amnion (most reptiles, all birds) and mammals.

What is the function of a swim bladder in fishes?

It assists them in various ways such as buoyancy regulation.

Plus One Zoology Chapter Wise Questions and Answers: Chapter-4 Biomolecules

What are biomolecules?

These biomolecules are the organic molecules living organisms need for their most basic life processes.

What is a zwitterion?

Zwitterions are molecules with charged both positively and negatively but is overall neutral. Amino acids on their isoelectric point for instance.

Differentiate between a nucleoside and a nucleotide.

Nucleoside has a pentose sugar and a nitrogenous base where as in nucleotide we have a pentose sugar, nitrogenous base and phosphate group.

What is the primary structure of a protein?

Structure Representative The order of amino acids in the polypeptide chain is called its primary structure.

What is a glycosidic bond?

A glycosidic bond is a covalent link between a carbohydrate molecule and another group.

Name two reducing sugars.

Glucose and fructose.

What is the significance of the R-group in amino acids?

The chemical nature of an amino acid carries with it certain properties (i.e., polarity, acidity), whose type and number are aspects defined by the R-group.

Which biomolecule is known as the "energy currency" of the cell?

ATP (Adenosine Triphosphate).

Define the term 'denaturation' of proteins.

Denaturation occurs when a protein loses its native structure by some external force and is therefore biological inactive.

Which type of bond holds nucleotides together in a DNA strand?

Phosphodiester bonds.

What is a peptide bond?

Peptide bond: A covalent bond that links two amino acids.

What is the function of an enzyme's active site?

It is the center which binds the substrate and induces a chemical change in the substrate to convert it into products.

What are prosthetic groups? Give an example.

A prosthetic group is a nonprotein component that is tightly bound to a protein. Example: Heme in hemoglobin.

Why are lipids not considered polymers?

Lipids do not have repeating monomer units, instead they all consist of fatty acids and glycerol.

What is the tertiary structure of a protein?

The 3D structure formed by folding of a polypeptide chain.

Define the term 'Glycosidic bond'.

It is a covalent bond that connects two monosaccharides by a condensation reaction.

What is the difference between α-helix and β-pleated sheets?

They are both secondary structures of proteins. In α-helix is a rope-like structure and β-pleated sheets are based on chains that are folded over, and lay parallel to each other.

Which biomolecule is involved in genetic information storage?

DNA is involved in genetic information storage.

What are conjugated proteins?

Conjugated proteins: proteins with non-protein groups (side chains) that are carbohydrates or lipids. Example: Glycoproteins.

What are the two main types of secondary protein structures?

Alpha-helix and beta-pleated sheet.

What is the bond between the phosphate group and pentose sugar in nucleotides called?

Phosphoester bond.

What is the role of water in hydrolysis reactions?

This then breaks the more complex molecule down to a simpler one, by donating an H+ and an OH- on the products.

How do competitive and non-competitive inhibitors differ?

In competitive inhibition, the substrate is blocked by an inhibitor that binds to the active site, whereas in non-competitive inhibition an inhibitor binds to a different area of the enzyme which alters its shape.

What is the chemical nature of cellulose?

It is a polysaccharide made up of β-glucose units linked by β-1,4-glycosidic bonds.

What is a saturated fatty acid?

A fat acid that has no carbon-to-carbon double bonds.

How are phospholipids different from triglycerides?

Phospholipids have one fatty acid replaced by a phosphate group and are therefore amphipathic, in contrast to triglycerides.

What is the difference between purines and pyrimidines?

Adenine and guanine are purines, which means they have a double-ring structure; while cytosine, thymine (in DNA), and uracil (in RNA) are pyrimidines with a single-ring structure.

Which enzyme digests proteins in the stomach?

Pepsin

What is the significance of the quaternary structure in proteins?

Quaternary Structure: involves multiple polypeptide chains that function as a single protein

What is a reducing sugar?

Glucose (a reducing sugar, i.e., can give electrons to another molecule)

What is the role of NAD+ in cellular respiration?

It is an electron carrier (reduced to NADH in redox reactions)

Why are enzymes temperature sensitive?

High temperatures denatures the enzyme, which alters its active site and makes them inactive.

What are the four levels of protein structure?

Primary, secondary, tertiary, and quaternary.

What is the role of chitin in nature?

It is structural polymer in anothers fungal cell wall and exoskletons of arthropods.

What is the Michaelis-Menten constant (Km)?

It is defined as the concentration of substrate at which the enzyme operates at half its maximum velocity.

What is chitin?

The exoskeletons of arthropods contain the polysaccharide chitin, composed of N-acetylglucosamine units.

What is the role of tRNA in protein synthesis?

tRNA transfers certain amino acids to the ribosome as it translates.

What are amphipathic molecules?

Amphiphilic molecule: A molecule having both a hydrophilic (polar) as well as a hydrophobic non-polar fatty acid regions e.g. phospholipids.

Define the term 'isoenzymes'.

Isozymes are structural forms of a specific enzyme (i.e. they specifically catalyze the same reaction, but have different structure).

How do hydrophobic interactions stabilize protein structure?

Due to hydrophobic interactions, non-polar side chains cluster inwards to exclude water, thus stabilizing the most of the protein core.

What is the difference between starch and cellulose?

Starch contains α-glucose units, while cellulose contains β-glucose units. It leads to different structural properties.

Plus One Zoology Chapter Wise Questions and Answers: Chapter-5 Digestion and Absorption

What is the role of saliva in digestion?

The saliva contains an enzyme salivary amylase which helps to digest the starch into maltose.

What is the function of the enzyme pepsin?

In the stomach, pepsin breaks proteins down into smaller peptides.

Why doesn't the stomach digest itself?

The stomach has a thick mucus-lined barrier to help protect it from its gastric juices (which can have a pH less than 1.0).

What is the role of bile in digestion?

Bile breaks down fats, emulsifying them into smaller droplets that are easier for lipase to digest.

Why are pancreatic enzymes inactive when secreted?

Trypsin is a pancreatic enzyme that is secreted as an inactive zymogen (trypsinogen) to avoid auto-digestion of the pancreas.

How is trypsinogen activated?

In the small intestine, enzymatic activation of trypsinogen is done by enterokinase whereby trypsiongen changes into trypsin.

What are villi, and why are they important?

Villi are little finger-like projections in the small intestine that serve to increase surface area for absorption.

Which part of the digestive system is responsible for maximum nutrient absorption?

The small intestine is responsible for maximum nutrient absorption.

What is the function of hydrochloric acid in the stomach?

Pepsin activity is increased in an acidic environment created by the acid, and it kills bacteria that comes with food.

What is peristalsis, and why is it important?

Peristalsis- wave like contractions of muscles in the digestive tract that helps to propel food along.

What is the role of the large intestine in digestion?

It finishes processing the food by absorbing remaining water and salts, compacts undigested food into feces.

Why is cellulose not digested in the human digestive system?

Cellulose in essentially grass and other plant fiber; humans do not produce the enzyme cellulase to digest cellulose.

What happens to proteins during digestion?

Pepsin, Trypsin and Chymotrypsin all function to break down proteins into peptides and amino acids.

How is fat absorbed in the small intestine?

After being emulsified by bile, fat is absorbed as fatty acids and glycerol through the lacteals in the villi.

What is the significance of microvilli in the small intestine?

The microvilli also serve to increase the surface area available for absorption on the villi.

Why is bicarbonate secreted into the duodenum?

Bicarbonate connects with the acidic chyme from the stomach to make the ph just right for enzyme functioning in the small intestine.

Which part of the digestive system secretes intrinsic factor, and what is its role?

The stomach releases a protein called intrinsic factor that is required for the absorption of vitamin B12 in the small intestine.

What is the role of gastrin in digestion?

Gastrin: Gastrin triggers the production of hydrochloric acid (HCl) in the stomach.

Why is the small intestine considered the main site for nutrient absorption?

The small intestine has a tremendous surface area thanks to villi / microvilli, as well as enzymes that make digestion complete so that the nutrients can be absorbed.

What is the role of chylomicrons in fat absorption?

Chylomicrons are lipoprotein particles that transport absorbed fats from the intestines into the lymphatic system.

How are amino acids absorbed into the bloodstream?

The absorption of amino acids occurs via active transport throughout the mucosal epithelial cells of the small intestine.

Why is emulsification of fats necessary for digestion?

Emulsification increases the fat's surface area, which allows lipase to digest it faster.

What is the function of lacteals in the digestive system?

Lacteal is basically a lymphatic vessel, however it does not carry lymph but instead carries dietary fats and lipids from the small intestine.

How is starch digestion completed in the small intestine?

Starch is broken down into glucose by pancreatic amylase, and the final step occurs through brush-border enzymes like maltase.

Which part of the digestive system has the highest pH, and why?

Bicarbonate ions secreted in order to neutralize the stomach acid are responsible for the higher pH of duodenum.

What is chyme, and where is it formed?

Chyme is a thick semi-liquid mass of partly digested food created by the stomach.

How is vitamin B12 absorbed?

Absorption of vitamin B12: Vitamin B12 is absorbed in the ileum with the help of intrinsic factor secreted by the stomach.

Why are certain vitamins referred to as 'fat-soluble'?

Fat-soluble-are vitamins absorbed with dietary fats and stored in the bodys fatty tissues.

What are brush-border enzymes, and where are they located?

Maltase, lactase, and peptidases are brush-border enzymes of the small intestine.

What is the role of secretin in digestion?

Secretin tells the pancreas to release bicarbonate so acid in the stomach is neutralised in the small intestine.

What is the difference between digestion and absorption?

Breaking down of food into smaller molecules is termed as digestion, while uptake of these molecules from our intestines to blood stream is referred to as absorption.

How does the liver contribute to digestion?

The liver produces bile which is stored in the gallbladder and then released into the small intestine for emulsification of fat.

What is the role of cholecystokinin (CCK) in digestion?

CCK acts to cause the gallbladder to contract and release stored bile into the intestine where it assists in digestion, especially of lipids by promoting emulsification.

Why do some people experience lactose intolerance?

This is because they lack the enzyme — lactase, which is responsible for splitting lactose into glucose and galactose.

How does the structure of the small intestine aid in absorption?

The mucosa of the small intestine contains villi and microvilli that greatly increase its surface area for nutrient absorption.

What is the role of the enzyme lipase?

lipase—digests fat into fatty acids and glycerol.

What are the consequences of reduced bile secretion?

Inadequate bile production affects the digestion and absorption of fat, resulting in fatty stools (steatorrhoea).

What happens to excess glucose in the body after digestion?

When to much substance is converted into glucose, it can be stored for later use as glycogen in the liver and muscle or transformed immediately into fat if body storage space is full.

What causes peptic ulcers?

Stomach lining wear-and-tear: Perforations are caused by the erosion of the stomach lining, mainly due to hyperactivity of gastric acid (most often in H. pylori-infected subjects), sometimes compounded by the use of NSAIDs.

How does the enteric nervous system regulate digestion?

It controls muscle contractions and enzyme secretions in the digestive tract. It regulats peristalsis and digestion

Plus One Zoology Chapter Wise Questions and Answers: Chapter-6 Breathing and Exchange of Gases

Why does the oxygen dissociation curve have a sigmoidal shape?

Because oxygen binds to hemoglobin cooperatively, so that the first oxygen molecule binding increases the affinity of the next one.

What happens to the partial pressure of oxygen in the alveoli during hyperventilation?

The partial pressure of oxygen increases.

Explain why carbon monoxide (CO) is toxic to humans.

CO binds to hemoglobin with 200× the affinity of oxygen, essentially rendering a portion of red blood cells unable to transport O2.

What is tidal volume and how much is it on average in an adult?

Tidal volume is the air that is inhaled or exhaled over a single breath, which in adults averages 500 mL.

How does the diaphragm contribute to inhalation?

When the diaphragm contracts it moves downward, which ends up increasing the volume of the thoracic cavity and decreasing pressure allowing for air to flow into the lungs.

What is the role of surfactant in the lungs?

It lowers the surface tension in alveoli, which keeps them from collapsing during inhalation and helps in lung expansion for gaseous exchange.

How does the Bohr effect facilitate oxygen release in tissues?

A feature of the Bohr effect, which tells us that higher levels of C02 and H* (lower pH) results in decreasing affinity of hemoglobin for 02 therefore donating O2 to tissues.

Define vital capacity and give its approximate value in a healthy adult.

Vital capacity—is the maximum volume of air that can be exhaled after a maximal inhalation (usually about 4,800 mL).

How is most carbon dioxide transported in the blood?

The major portion of CO_2 (~70%) is carried as bicarbonate ions (HCO_3^-) in the plasma.

What is the chloride shift (Hamburger phenomenon)?

Defined as a process in which chloride (Cl^-) shifts across the red cell membrane for bicarbonate ion(HCO_3^-)to preserve electrochemical balance during CO_2 transport.

How does the respiratory center in the brain regulate breathing?

Searching for 'medulla respiratory centre CO2 and O2 in bloodgas' it is the last result.!

What happens to the oxygen dissociation curve during exercise?

In this scenario, the curve shifts to the right showing less affinity of hemoglobin for oxygen to enhance blood-oxygen unloading in tissues.

Why does hypercapnia stimulate an increase in respiratory rate?

Hypercapnia (high CO_2 levels) drops blood pH, which then stimulates chemoreceptors that induce greater respiratory rate to remove excess CO_2.

What is the respiratory quotient (RQ) and what is its value for carbohydrates?

Where RQ is the respiratory quotient which means the ratio of CO_2 produced to O_2 consumed, Its value for carbohydrates = 1.0

How do high altitudes affect breathing and gas exchange?

At higher altitudes, atmospheric pressure is lower so the partial pressure of oxygen will be lower leading to hypoxia and hyperventilation.

What is the significance of the Hering-Breuer reflex?

The Hering-Breuer reflex helps prevent lung over-inflation by ceasing inspiratory signals in seconds when the lungs have stretched.

How does fetal hemoglobin differ from adult hemoglobin in oxygen affinity?

Fetal hemoglobin has a higher affinity for oxygen than adult hemoglobin, so this allows human mothers to supply enough oxygen to their fetuses even though the structures are not very changed between them.

What is the function of the pleura surrounding the lungs?

The pleura secrete a fluid to help lubricate the lungs and create a pressure differential which allows for lung expansion during normal respiration.

Why is the partial pressure of oxygen lower in alveolar air than in atmospheric air?

Since alveolar air is diluted with water vapor and CO_2, its partial pressure of oxygen is lower than atmospheric air.

What effect does a rise in blood CO_2 levels have on blood pH?

Here, CO_2 increase → H^+concentration rise → DECREASE IN BLOOD pH (ACIDOSIS)

How do central chemoreceptors in the brain detect changes in CO_2 levels?

Cental chemoreceptors sense changes in CO2 levels which is detected as change in pH of cerebrospinal fluid.

What is emphysema, and how does it affect gas exchange?

Emphysema sick lungs with damaged alveoli is all sorts of messed up shape cough gas exchange surface is reduced brittle overtime breathing difficulty

What role do the intercostal muscles play in respiration?

Intercostal muscles: These muscles contract during inhalation, and raise the rib cage in order to assist in breathing movements.

What is the functional residual capacity (FRC)?

FRC is the amount of air that stays in your lungs after breathing normally and it averages about 2,400 mL.

Why does oxygen bind less tightly to hemoglobin in acidic conditions?

Hemoglobin undergoes a conformational change, in acid conditions, altering its structure and reducing affinity for oxygen, which makes the latter more available to tissues given that the blood has acquired a proton ——> good old Bohreffect.

How does anemia affect oxygen transport in the body?

It lowers the count of red blood cells or hemoglobin, which may decrease the oxygen capacity of the blood in a person.

What is the respiratory membrane?

Respiratory membrane — the thin barrier where gas exchange takes place between alveolar air and blood in the capillaries.

What is hypoxia and what are its types?

Hypoxia: An inadequate supply of oxygen to tissues. There are four different types of hypoxia: hypoxic, anemic, stagnant and histotoxic hypoxia.

How does oxygen therapy help in carbon monoxide poisoning?

That oxygen therapy has the function of raising the partial pressure of oxygen and thus making that it displaces CO from hemoglobin, causing an improvement in transport and normal supply.

What are pneumotaxic and apneustic centers, and where are they located?

These centers in the pons, control the rate and pattern of breathing. The pneumotaxic center is inhibitory to inspiration, whereas the apneustic centers are excitatory.

How is the oxygen-carrying capacity of blood affected by high altitude training?

High altitude training can boost the number of red blood cells, which have enhanced oxygen-carrying ability due to having more erythropoietin (EPO) released.

What happens to the levels of oxygen and carbon dioxide during hypoventilation?

Hypoventilation results in decreased oxygen levels and increased carbon dioxide, followed by respiratory acidosis.

Why does diffusion of gases become less efficient in pulmonary fibrosis?

Pulmonary fibrosis increases the distance between alveoli and capillaries since the alveolar walls get thicker, therefore gas diffusion becomes less efficient.

What causes the oxygen dissociation curve to shift to the left?

In contrast, factors such as low temperature, low CO_2, higher pH shift the curve to left which makes hemoglobin carry more oxygen.

How does respiratory acidosis differ from respiratory alkalosis?

Respiratory acidosis refers to the process of drawing too much CO_2 out, lowering the pH, with respiratory alkalosis referring to blowing off a lot of CO_2, raising the pH.

What is the effect of temperature on hemoglobin's affinity for oxygen?

Oxygen release to tissues is also promoted as a result of higher temperatures lowering hemoglobin's affinity for oxygen.

What is minute ventilation, and how is it calculated?

TV: Tidal volume is, predictably the amount of air that moves into & out of a person's lungs during normal breathing time RR : Respiratory Rate The rate at which someone breathes Minute ventilation The total amount of new air moved in or out per min!= TV x RR

Plus One Zoology Chapter Wise Questions and Answers: Chapter-7 Body Fluids and Circulation

What is the primary component of human blood?

The most important part is plasma, which accounts for about 55% of blood. The fluid has water, proteins, electrolytes, nutrients and waste products.

Why are erythrocytes biconcave in shape?

Their biconcave shape (a flattened disc) has a few benefits : it increases the surface area for gas exchange and allows erythrocytes to move through narrow capillaries easily.

What is the Bohr effect in relation to hemoglobin?

The Bohr effect explains that at high carbon dioxide concentrations, the affinity of hemoglobin for oxygen is lower and so it releases more on body tissues.

How does the lymphatic system aid the circulatory system?

The lymphatic system takes up any extra tissue fluid (called lymph) and puts it back in our blood circulation, so that the right amount of fluids is there in your body.

Why do veins have valves but arteries do not?

The veins have valves in place designed to prevent back flow of blood as there is lower blood pressure within the veins particularly if it involves limbs and blood returning to the heart against gravity.

What is the significance of the hepatic portal vein in circulation?

The hepatic portal vein is a major blood vessel in humans that drains nutrient-rich blood from the digestive system to the liver as well as connecting blind systems.

How does a higher concentration of red blood cells affect blood viscosity?

Thicker, higher viscosity blood is harder for the heart to pump over long periods of time.

Why is the SA node referred to as the pacemaker of the heart?

The SA node starts the electrical impulses that control the uniform beating of the heart, determine its rate, and select as well.

What is the main difference between the pulmonary and systemic circulations?

The blood leaving the right heart is then pumped to the lungs where it receives oxygen (pulmonary circulation), and the blood returning into the left heart is being pumped through out our entire body, delivering that vital oxygen supply (systemic circulation).

How does the body regulate blood pressure during sudden postural changes (e.g., standing up quickly)?

Arteries contain baroreceptors that detect changes in blood pressure and initiate the necessary heart rate adjustments and vessel dilation to keep this steady.

Why is the left ventricle wall thicker than the right ventricle?

This causes greater force for the left ventricle to pump blood to the entire body than it does for the right ventricle to pump blood just to the lungs.

What role does albumin play in blood plasma?

It is important because it keeps the osmotic pressure, which regulates the movement of water between blood and tissue, can carry some substances.

How do platelets initiate blood clotting?

After a vessel is damaged, platelets stick to the site and release chemicals that begin the clotting cascade.

What is the significance of the P wave in an ECG?

P wave-Atrial Depolarization. electrical impulses generating the atrial contraction.

How does the presence of carbonic anhydrase in red blood cells help in CO_2 transport?

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What is the importance of intercalated discs in cardiac muscle?

Be young and rigid interkingdom discs, which are clustered junctions between cardiac muscle cells that enable the rapid transfer of electrical impulses between cells, thus enabling synchronized contractions of cardiac muscle.

Why does fetal hemoglobin have a higher affinity for oxygen than adult hemoglobin?

In the placenta, fetal hemoglobin must be able to unload oxygen effectively from maternal blood and so it has a higher affinity for oxygen.

What is the function of the coronary arteries?

The coronary arteries carry oxygenated blood to the myocardium so it has adequate good oxygen supply.

How does the Frank-Starling law relate to heart function?

The Frank-Starling law explains that there is a limit to this, because of the more you stretch your heart+s muscle (by which you I mean its preload) during filling, the greater than subsequent contraction strength of it goes up to some sort of volume.

Why is hemoglobin considered an oxygen buffer?

By binding and releasing oxygen as per the surrounding partial pressure of oxygen, hemoglobin helps to regulate blood oxygen.

Plus One Zoology Chapter Wise Questions and Answers: Chapter-8 Excretory Products and Their Elimination

What is the main nitrogenous waste in humans, and how is it excreted?

In humans, urea is the chief nitrogenous end product predominantly found in urine from the kidneys.

Why is the loop of Henle important for urine concentration?

It creats a medullary concentration gradient that enables the collecting duct to reabsorb only water, hence urine is concentrated.

What is counter-current mechanism in the kidney, and where does it occur?

That counter-current mechanism happens between loop of Henle and vasa recta, maintaining a concentration gradient that helps water reabsorption.

Why do desert animals often excrete uric acid instead of urea?

URIC ACID — needs less water for excretion than does urea, and allows desert-dwelling animals to save even more of that life-sustaining juice.

What is osmoregulation and how do kidneys contribute to it?

Osmoregulation is the regulation of water and solute balance. This is controlled by the Kidneys which does it by regulating the volume and composition of body fluids via urine formation.

What is the role of aldosterone in kidney function?

It acts on the kidneys to promote sodium reabsorption and potassium excretion, thereby increasing blood pressure and maintaining fluid balance.

How does the structure of the nephron contribute to filtration?

This prevents the passage of large things like proteins into Bowmans capsule while excluding waste materials through selective filtration from blood.

Why is creatinine clearance a useful measure of kidney function?

The creatinine clearance is a test that allows your health care provider to determine how well your kidneys are working at removing waste from your blood.

What are juxtaglomerular cells, and what is their function?

The cells that make up the juxtaglomerular apparatus, secrete the proteolytic enzyme renin, which is involved in blood pressure regulation by activated renin-angiotensin-aldosterone system (RAAS).

How does ADH (antidiuretic hormone) influence urine formation?

ADH acts on the collecting ducts to increase their water permeability, which results in water reabsorption and production of concentrated urine.

Explain the role of the proximal convoluted tubule (PCT) in excretion.

It reabsorbs water, ions, glucose and amino acids that are need to be returned tightened up the volume of excretory fluid.

How do kidneys regulate blood pH?

They mainatain homeostasis of the acid base balance by excreting hydrogen from blood in the urine and resorbing bicarbonate from urine.

What is the difference between cortical and juxtamedullary nephrons?

Juxamedullary nephrons have loops of Henle that extend deep into the medulla allowing them to assist in urine concentration, whereas cortical nephrons are located primarily in the cortex and their loops are quite shallow.

How does the body respond to high levels of urea?

Uremia: The inability of the kidneys to excrete urea which leads to high levels of urea and toxic conditions in the body Calls for medical intervention like dialysis.

What is dialysis, and how does it mimic kidney function?

Dialysis is a medical process of filtering the blood and removing waste products and excess fluid from the body that kidney can no longer remove by themselves.

Why is ammonia not a primary excretory product in humans?

The one and only by-product of ammonia is water and this requires to be excreted in massive amounts. The more toxic ammonia is converted to urea making it easier for our bodies to excrete while using less water.

What is the significance of the renal threshold for glucose?

The glucose renal threshold is the maximum blood glucose level that can be reabsorbed by the kidneys. This proprietary blend was developed to help establish

whether the blood glucose is higher than this threshold level and then it generates glucose in the urine, which could be an indication of a kind of diabetes.

How does the body compensate for low water intake in terms of excretory function?

ADH levels are elevated in the setting of decreased water intake, promoting more reabsorption of water by the kidneys and thus excretion of more concentrated urine.

What role do kidneys play in erythropoiesis?

When there is a low supply of oxygen, the kidneys produce a hormone called erythropoietin which activates production of red blood cells in the bone marrow.

How does the body eliminate non-volatile acids generated during metabolism?

The kidneys excrete hydrogen ions in the urine returning bicarbonate to the blood (net addition of alkali) helping to maintain acid base balance by eliminating metabolic acids (non-volatile acids).

Plus One Zoology Chapter Wise Questions and Answers: Chapter-9 Locomotion and Movement

What is the difference between ciliary and flagellar movement?

Ciliary movement—numerous small, hair-like structures (cilia) beat in coordination.

Flagellar movement—involves a few longer, whip-like flagella that undulate and propel the cell

Why is actin called a thin filament in muscle contraction?

Actin filaments in the muscle fiber structures are thinner than myosin filaments therefore actin is known as a thin filament.

Explain the sliding filament theory of muscle contraction.

Thus, during muscle contraction the actin filaments are moving over or acrossy myosin filaments causing shortening of the sarcomere without affecting the lengths of the myofilaments themselves, which is proposed by sliding filament theory.

Why do muscles fatigue after prolonged activity?

Fatigue results from the build-up of lactic acid (an intracellular ion with a low pH) and depletion of ATP during prolonged muscular activity that impair the muscle's ability to contract effectively.

What role does calcium play in muscle contraction?

When calcium enters the muscle cell it binds with troponin on the actin filaments, this binding causes a change in shape that exposes actin so myosin heads can attach and contract.

What is the difference between red and white muscle fibers?

Red muscle fibrers (slow twitch) have more myoglobin and mitochondira that are good for sustained activities like running White muscle fibers, or fast-twitch muscles, fire rapidly and then exhaust in turn to help with brief action.

How does ATP facilitate muscle contraction?

After the power stroke, ATP binds to the myosin head and allows it to separate from the actin filament This last feature allows them to relax after the contraction and undergo hydrolysis of ATP that can re-cock the myosin head ready for another contraction cycle.

What are antagonistic muscles? Provide an example.

Antagonistic muscles mean a pair of muscles, such as the biceps and triceps. One of them contracts and the other relaxes -- this is what allows movement.

Explain the role of sarcoplasmic reticulum in muscle contraction.

The sarcoplasmic reticulum is the storage site for calcium ions that are released and bind to initiate contraction of acton with myosin filaments.

What is the H-zone in a sarcomere, and how does it change during muscle contraction?

The H-zone, which contains only myosin filaments in the middle of the sarcomere. During contraction, actin filaments slide inward and the overlap is either shorter or disappears entirely.

What is the significance of the myosin cross-bridge in muscle contraction?

When the myosin head attaches to actin and pulls them towards thecenter of sarcomere, this action creates force for contraction.

Differentiate between isotonic and isometric muscle contractions.

Isotonic contractions, on the other hand, involve changes in muscle length (shortening or lengthening) while force is being produced. It is responsible for generating force without any change in length during the contraction (isometric contractions).

How does rigor mortis occur?

After death, without production of ATP to free the myosin heads from actin filaments, rigor mortis occurs; this is a continual muscle contraction.

What role do synovial joints play in locomotion?

Synovial joints which enable unlimited movement between bones allowing complex motoric functions like rotation, flexion & extension of limb that are so critical for locomotion

How do tendons and ligaments differ in their function?

Tendons bind muscles to bones to transport the power of muscle contraction for movement, and ligaments unite bones to other bones so that joints remain stable.

What is the role of the neuromuscular junction in muscle contraction?

Motor neuron release Acetylcholine at the Neuromuscular junction to depolarize the cell membrane of muscle cell that brings about muscle contraction.

Why is skeletal muscle referred to as striated muscle?

When you look at skeletal muscle under a microscope, the alternating pattern of light (I bands) and dark (A bands) results in a striated appearance from actin and myosin filaments.

Explain the role of ATPase in muscle contraction.

In the myosin heads, ATPase is an enzyme that breaks down ATP to provide the energy for the power stroke in muscle contraction.

How do bones and muscles work together to produce movement?

They contract and pull on bones, functioning almost as levers. Muscles convey forces to bones through tendons and joints allow movement at specific locations.

What is muscle hypertrophy, and what causes it?

Hypertrophy of muscles, an increase in the volume of muscle fibers through a growth process involving protein synthesis-occurs as an adaptation to the hyperbolism lambda (i.e. resistance) stimulus.

Plus One Zoology Chapter Wise Questions and Answers: Chapter-10 Neural Control and Coordination

What is the role of myelin sheath in nerve impulse transmission?

The myelin sheath insulates axons and enables the rapid conduction of nerve signals in a process called saltatory conduction, where it effectively jumps between nodes of Ranvier.

How does the sodium-potassium pump maintain the resting membrane potential of a neuron?

The voltage of the resting membrane potential is roughly -70 mV and this gradient is what the sodium-potassium pump works to create: 3 sodium ions are actively transported out while 2 potassium ions are brought in.

Why are action potentials considered "all or none" responses?

An action potential will occur to its full extent if threshold potential is reached When the stimulus does not reach this threshold, an action potential is not generated. The rule of all or none

What is the significance of the refractory period in neurons?

The refractory period serves to ensure that an action potential only moves in one direction down the neuron, and it also prevents the neuron from becoming over-excited.

How do excitatory and inhibitory neurotransmitters affect postsynaptic neurons?

Excitatory neurotransmitters (e. g., glutamate) depolarize the postsynaptic membrane, increasing the chance of an action potential, while inhibitory neurotransmitters (e. g., GABA) hyperpolarize it, thus making it tougher for an action potential to occur.

What is the difference between a nerve and a neuron?

The basic unit of the nervous system is a neuron which are single nerve cells that conduct electrical impulses, and a nerve is several (hundreds or thousands) number of axons from many neurons that transmit electrical signals to and from different parts of the body.

How does the synaptic cleft contribute to neural communication?

The synaptic cleft is the gap between the presynaptic neuron and the subsequent postsynaptic neuron through which neurotransmitters are released, permitting chemical communication from one neuron to another.

What would happen if acetylcholine (ACh) is not broken down after transmission at a neuromuscular junction?

When acetylcholine is not broken down by a cholinesterase, then the action continues of muscle leading of prolonged muscular contraction or spasms.

What is the role of calcium ions (Ca^{2+}) in synaptic transmission?

When the presynaptic neuron depolarizes, calcium ions enter and stimulate the vesicle to fuse with the membrane, which causes neurotransmitters to be released into the synaptic cleft.

How does the central nervous system differ from the peripheral nervous system?

Essentially, the central nervous system (CNS) is made up of the brain and spinal cord, which processes information from our sensory organs and issues motor commands. Whilst the peripheral nervous system (PNS) acts as a communication relay with all other parts of our body – transmitting signals to and from its depths.

What is the function of the corpus callosum in the brain?

The corpus callosum links the two hemispheres of the brain and facilitate communication and corresponding activities between them.

How does a reflex arc function in protecting the body from harm?

when any stimulus is generated, the reflex arc can automatically respond to this without demanding brain intervention.

It means that your body can give a prompt reaction within no fraction of the time in high-danger situations like it directly uses spinal cord for processing and gives you results.

What are the structural differences between sensory and motor neurons?

Sensory neurons have long dendrites and short axons that carry the nerve impulses from sensory receptors of PNS to CNS.

While motor neurons have a few short dendrites and an actual but very long axon carrying the impulse from CNS to muscles or glands,[],).

Why is the blood-brain barrier important in neural coordination?

The blood brain barrier isolates the brain from noxious blood contents while letting in useful substances wanted for metabolic purposes and gaseous exchange to keep up a proximity between other biological units for normal neuronal activity.

How does Parkinson’s disease affect neural coordination?

Parkinson's disease is a neurodegenerative disorder that occurs due to the selective loss of dopaminergic neurons in the substantia nigra and subsequent alterations in communication within the motor pathways, producing tremors, rigidity and bradykinesia.

Plus One Zoology Chapter Wise Questions and Answers: Chapter-11 Chemical Coordination and Integration

What is the role of the hypothalamus in chemical coordination?

It is the connection of the central nervous system and endocrine system. Controls released hormones from the pituitary and body temperature, hunger and also thirst to preserve homeostasis.

How does negative feedback control the secretion of hormones?

In negative feedback, whatever hormone is at too high a level in the blood stream inhibits further release of additional hormones by telling the gland to diminish or cease secretion. When there are high levels of thyroid hormones, they inhibit the production of TSH by your pituitary.

Why is the pituitary gland often referred to as the "master gland"?

The pituitary releases tropic hormones that activate other endocrine glands, which is why it's known as the "master gland," because its primary function is to regulate certain activities of most of the other endocrine glands in your body like the thyroid, adrenal and gonads.

What is the difference between peptide hormones and steroid hormones?

For example, peptide hormones are amino-acid based and are typically water-soluble (e.g. insulin), and steroid hormones that derived from cholesterol and is lipid-soluble (e.g., cortisol). Peptide hormones that bind to a surface receptor, and the steroid hormone that is able to enter for binding intracellular receptors.

How does the pancreas act as both an endocrine and exocrine gland?

It has an endocrine function and an exocrine function,maintains the level of sugar in the blood. The pancreas releases insulin and glucagon (endocrine) to regulate blood sugar levels, and digestive enzymes (exocrine) into the small intestine.

What is the function of aldosterone and which gland secretes it?

Aldosterone is formed in the adrenal cortex and it functions as a vital mediator of blood pressure through ion transport of sodium and water into renal tubule schematic in the kidneys which leads to the increased amount and hence increasing in blood volume, thus this raises blood pressure levels.

Explain the role of melatonin in the human body.

Melatonin: This naturally occurring hormone controls sleep-wake cycles (circadian rhythms), with levels peaking at night and dipping in the morning. The more melatonin your body makes during darkness, the more you will sleep and the less being made while in light prevents you from having a peaceful rest.

What is the difference between endocrine and exocrine glands?

Endocrine glands secrete hormones directly into the bloodstream(e.g. thyroid, pituitary) OR in contrast exocrine glands release their products into ducts leading to target areas (e.g. sweat glands, salivary glands).

How does the parathyroid hormone regulate calcium levels?

Parathyroid hormone (PTH, in turn, increases blood calcium levels through inhibiting bone from depositing calcium, increasing initial absorption of the mineral by intestine and by inhibiting final excretion by kidney.

What happens when there is hypersecretion of growth hormone in adults?

If there is hypersecretion of growth hormone in adults, acromegaly develops: the bones of hands, feet and face grow (due to excessive proliferation of soft tissues and bones).

Describe the relationship between insulin and glucagon.

Insulin and glucagon are both released by the pancreas but have opposing functions. Insulin causes blood sugar to fall by driving the uptake of sugar out of bloodstream into cells, while glucagon causes blood sugar to rise by telling the liver to break up stored glycogen.

What is Addison's disease, and what causes it?

Insufficient production of hormones (especially cortisol and aldosterone) from the adrenal cortex leading to Addison's disease. It causes fatigue, weight loss, low blood pressure and hyperpigmentation of the skin.

How do thyroid hormones affect metabolism?

T3 and T4 are thyroid hormones that keep the bodys metabolic rate in check. These hormones increase the speed at which cells change oxygen and nutrients into

energy, governing overall metabolism; they exert broad influences on body weight, fuel reserves, mental state and temperature.

Why does the adrenal medulla secrete epinephrine and norepinephrine during stress?

Stress causes the adrenal medulla to secrete epinephrine (adrenaline) and norepinehrine into the bloodstream which allow it to be in a constant state of readiness for a "fight or flight" response.

They stimulate heart rate, blood pressure, and energy availability by liberating glucose and free fatty acids.

What is Cushing's syndrome, and what are its symptoms?

Cushing's syndrome — Exposure to high levels of the hormone cortisol occurring in Cushing's disease, for example, is one cause.

These symptoms can include weight gain, particularly around the trunk area — meaning on the abdomen — a round looking face, high blood pressure and skin thinning causing easy bruising.