Top 100+ Biology Questions for NDA: Solution

1. Ans. C.

• The **gluteus maximus** is the largest muscle in the human body.

• It is large and powerful because it has the job of keeping the trunk of the body in an erect posture.

• It is the chief antigravity muscle that aids in walking up stairs.

• The hardest working muscle is the **heart**.

2. Ans. D.

* Individuals with type **AB Rh D positive blood** are called universal recipients.

* Individuals with type **O Rh D negative blood** are often called universal donors.

3. Ans. A.

• **Node-** It is the part of the stem where a leaf arises.

• **Tuber-** It is the thickened part of an underground stem of a plant.

• **Carpel-** It is the female reproductive part of a flower.

• **Bud-** It is a small pointed lump that appears on a plant and develops into a leaf or a flower.

4. Ans. D.

• **Oxalic acid is a natural product found in spinach.**

• Oxalic acid is an organic compound found in many plants.

• It is a colorless crystalline solid that forms a colorless solution in water.

5. Ans. C.

• The major natural source of the **Vitamin D** is synthesis of cholecalciferol in the lower layers of epidermis skin through a chemical reaction that is dependent on sun exposure.

• Ultraviolet B rays from sunlight is a large source of vitamin D

• Vitamin D from the diet, or from skin synthesis, is biologically inactive.

6. Ans. D.

Classification of Vertebrates :

• Pisces

• Amphibia

• Reptilia

• Aves

• Mammalia

7. Ans. A.

• Xylem tissue is known as water conducting tissue . Xylem is for transporting water and minerals absorbed by the roots .

• Phloem is responsible for transporting food from leaves (photosynthesis site) to non - photosynthesizing parts of a plant such as root and stems.

• Simple tissue are homogeneous -Composed of structurally and functionally similar cells.

• Example- Parenchyma ,Collenchyma and Sclerenchyma .

• Permanent tissues are made of meristematic cells, that has definite form and shape and have lost the power to divide and differentiate and are three types- simple, complex and special.

8. Ans. A.

Formation of gametophyte directly from sporophyte without meiosis and spore formation is apospory .The gametophyte has a diploid number of chromosomes such gametophyte may form viable gametes which fuse to form tetraploid sporophyte.

• Apogamy is the development of sporophyte directly from gametophytic tissue without fusion of gametes .

• Amphimixis is normal sexual reproduction .

• Parthenogenesis is the development of an embro from an egg without fertilization.

9. Ans. B.

• Lysergic acid is formed by ergot fungi. Ergot fungi refer to a group of fungi of the genus Claviceps. The most common is Clevice pspurpuea .It causes ergotism in man and other mammals.

• Heroin, also known as diacetylmorphine and diamorphine and among other names, is an opioid used as a recreational drug for its euphoric effects .

• THC ,Tetrahydrocannabinol is the principal psychoactive constituent of cannabis and one of at least 113 total cannabinoids identified in the plant.

• Cannabinoid are naturally occurring compounds found in the cannabis sativa plant. Of over 480 different compounds present in the plant ,only around 66 are termed cannabinoids .

10. Ans. B.

A huge Ecosystem on land having distinct kind of vegetation and Wild-life is called as a Biome.

Features -

• The biome is the largest geographic biotic unit, where a major community of plants and animals with similar life forms and environmental condition exists.

• They can be found over a range of continents.

• Biome has distinct biological communities that have formed in response to a shared physical climate.

• Biome is a broader term than Habitat; any biome can comprise a variety of Habitats.

11. Ans. D.

Vitamin B6, B9 and B12 are basic for mental wellbeing and are otherwise called *Brain Vitamins.*

B - Vitamins are significant for cell metabolism. Vitamins B6 (Pyridoxine), B9 (Folic acid), and B12 (Cobalamine) can also reduce levels of the Amino acid Homocysteine.

Vitamin B-5 is for the health of the brain and nervous system.

Vitamin B-6 helps the body to make new red blood cells, which carry oxygen throughout the body.

12. Ans. A.

The partnership between Nitrogen-fixing bacteria and leguminous plants is one example of Mutualism.

The term *Mutualism* refers to a relationship in biology between two living things which are mutually beneficial to each other.

Ex: Flowering plants being pollinated by insects and Corals with Zooxanthellae.

13. Ans. D.

Fibula is a leg bone and is thinnest in the human body. The *fibula or calf bone* is a leg bone located on the lateral side of the tibia, with which it is connected above and below.

Femur - The femur, or thigh bone, is the longest, heaviest, and strongest bone in the entire human body.

Stapes is the third bone of the three Ossicles in the Middle-Ear is the smallest bone in the human body.

14. Ans. A.

Hypothalamus Gland forms an important link between the Nervous System and the Endocrine System via the pituitary gland.

It helps in maintaining the body temperature, control sleep, hunger, thirst, emotions and moods and also helps in releasing Hormones.

Hypothalamus is a small region of the brain.

15. Ans. B.

Vitamin A is responsible for the Night Blindness. Vitamin A, or Retinol, is an essential nutrient for vision. Vitamin A is a group of unsaturated nutritional organic compounds that includes Retinol, Retinal, Retinoic Acid, and Provitamin A carotenoids.

Source of Vitamin A are Cold liver Oil, Eggs, Fortified Skim Milk, Yellow Vegetables, and Fruits.

16. Ans. B.

Nitrates in drinking water are responsible for Blue Baby Syndrome. A sort of "Blue Baby Syndrome", it can also be caused by methemoglobinemia. It is widely believed to be caused by nitrate contamination in groundwater resulting in the decreased oxygen-carrying capacity of hemoglobin in babies leading to death.

17. Ans. B.

In humans, each cell contains 23 pairs of chromosomes, i.e. a total of 46. Twenty-two of these pairs, called Autosomes, and same in both males and females. The 23rd pair, which is the Sex Chromosomes, differ between males and females and determine the gender.

18. Ans. C.

Cytokinin is the plant hormone that is helpful in making RNA and Protein in plants. Cytokinin is the procedure of advancement and tissue development and repair of higher plants and creatures.

Cytokinesis, in biology, is the procedure by which one cell physically separates into two cells.

19. Ans. D.

Cancer Cells acts as Parasites cell in the body. Parasites are a kind of infection that need to live on, or in another creature to survive.

Viruses are the usual infectious agents that cause cancer, but Mycobacterium, some other bacteria and parasites also have an effect.

A virus that can cause cancer is called an Oncovirus. Cancer is caused by accumulated damage to genes and it is a disease caused by genetic changes leading to uncontrolled cell growth and tumor formation.

20. Ans. B.

Breathing or "external respiration "brings air into the lungs where gas exchange takes place in the lungs where gas exchange takes place in the alveoli through diffusion .The body's

circulatory system transports these gases to and from the cells, where "cellular respiration" takes place.

More Details- Respiration is the biochemical process in which the cells of an organism obtain energy by combining oxygen and glucose, resulting in the release of carbon dioxide, water and ATP (the currency of energy in cells).The number of oxygen, carbon dioxide and water molecules involved in each turn of the process .

Inspiration (Inhalation) is the process of taking air into the lungs. It is the active phase of ventilation because it is the result of muscle contraction. During inspiration, the diaphragm

contracts and the thoracic cavity increase in volume. This decreases the intra alveolar pressure so that air flows into the lungs.

Expiration is the phase of ventilation in which air is expelled from the lungs It is initiated by relaxation of the inspiratory muscles; Diaphragm - relaxes to return to its resting position

, reducing the superior /inferior dimension of the thoracic cavity.

21. Ans. B.

Ventral respiratory group contains both inspiratory and expiratory neurons and

controlled forced breathing while dorsal respiratory group contains only inspiratory neurons control normal breathing.

More Details -

● The dorsal respiratory group is in the distal portion of the medulla. It receives input from peripheral chemoreceptors and glossopharyngeal nerves. These impulses generate inspiratory movements and are responsible for the basic rhythm of breathing.

● The pontine respiratory group represents the "pneumotaxic centre", which acts as a switch off controlling the point at which inspiration is terminated and therefore determining the depth and frequency of breathing.

22. Ans. D.

The black opening between the aqueous humour and the eye lens is called pupil.

More Details- The retina is the thin layer of cells that lines the back of the eyeball in humans and in many animals. It is made mainly of neurons and its role is to sense the light which gets into the eye and send information about it to the brain.

Cornea is the clear outer layer at the front of the eye. The cornea helps your eye to focus light so you can see clearly.

Iris controls the amount of light that enters the eye by opening and closing the pupil.The iris uses muscles to change the size of the pupil. These muscles can control the amount of light entering the eye by making the pupil larger(dilated) or smaller (constricted).

23. Ans. B.

● Two types of transport tissues are found in vascular plants -

(i) phloem (ii) xylem.

● The most internal layer of the bark of a tree is phloem. Its main function is to transport soluble organic matter produced in the process of photosynthesis. Phloem will also be damaged by removing its bark from near the base of the tree, due to which the nutrients produced by the leaves in the process of photosynthesis will not reach the roots and the roots will be deprived of energy.

24. Ans. C.

The bottom part of the brainstem is called the Medulla oblongata. The medulla oblongata has nerve centers to control many vital body processes like swallowing, vomiting, breathing and heartbeat etc.

More Details- The cerebellum (which is Latin for "little brain") is a major structure that is located at the back of the brain, underlying the occipital and temporal lobes of the

cerebral cortex. The cerebellum is important for making postural adjustments in order to maintain balance.

The cerebrum, telencephalon or endbrain is the largest part of the brain containing the

cerebral cortex (of the two cerebral hemispheres) as well as several subcortical structures including the hippocampus basal ganglia and olfactory bulb. In the human brain the

cerebrum is the uppermost region of the central nervous system.

25. Ans. B.

● Metformin is used as an Anti-Diabetic drug. This drug has beneficial effects on glucose metabolism and promotes weight loss or at least weight stabilization. In addition, numerous studies have demonstrated that metformin can reduce mortality and the

risk of complications. This drug decreases glucose production by the liver and increases the insulin sensitivity of blood tissues.

More Details -

Thorazine (chlorpromazine) is a phenothiazine antipsychotic medication used to treat psychotic disorders such as schizophrenia or manic depression and severe behavioral problems in children.

Hydralazine is used with or without other medications to treat high blood pressure. Lowering high blood pressure helps prevent strokes, heart attacks and kidney problems .Hydralazine is called a vasodilator.

26. Ans. D.

● Generally, blindness is caused by the dryness and hardness of the cornea. Cornea is a clear layer which helps the passing of light. It is an outer layer and can be transferred from one person to another.

More Details- The retina is the thin layer of cells that lines the back of the eyeball in humans

and in many animals, It is made mainly of neurons and its role is to sense the light which gets into the eye and send information about it to the brain.

Cornea is your eye's clear ,protective outer layer.

The Iris is located in front of the lens and ciliary body and behind the cornea with increased pigment the shade becomes deep brown to black.

27. Ans. C.

The AVN or the atrioventricular node is located in the lower left corner of the light atrium.It is situated close to the atrioventricular septum which separates the atria and the ventricles.

More Details- The sinoatrial or SA node, a small area of tissue in the wall of the atrium, sends out an electrical signal to start the contracting of the heart muscle. This node is called the pacemaker of the heart because it sets the rate of the heartbeat and causes the rest of the heart to contract in its rhythm.

The left ventricle is one of four chambers of the heart. It is located in the bottom left portion of the left atrium separated by the mitral valve ,The left ventricle is the ventricle is the thickest of the heart's chambers and is responsible for pumping oxygenated blood to tissues all over the body.

Aorta is the main artery that carries blood away from your heart to the rest of your body.
Topic |||Science||Biology|| Circulatory System

28. Ans. C.

A. Trichinosis is a parasitic disease caused by roundworms of the Trichinella type. During the initial infection diarrhea, abdominal pain, and vomiting may occur.

B. Sleeping sickness, also called "human African trypanosomiasis", is a widespread tropical disease that can be fatal if not treated. It is spread by the bite of an infected tsetse fly.

C. Athlete's foot refers to a fungal skin eruption that is confined to the foot in both

athletes and nonathletes. It can occur anywhere on the foot, including the sole, toe webs, and back of the foot.

D. Meningitis is an inflammation (swelling) of the protective membranes covering the brain and spinal cord. A bacterial or viral infection of the fluid surrounding the brain and

spinal cord usually causes the swelling.

29. Ans. B.

Heredity is the process of passing the traits and characteristics from parents to their offspring's.

More Details- Genetic variation is a term used to describe the variation in the DNA sequence in each of our genomes. Genetic variations are what makes us all unique, whether in terms of hair colour,skin color or even the shape of our faces.

Inheritance is the process by which genetic information is passed on from parent to child.This is why members of the same family tend to have similar characteristics

30. Ans. A.

● Malaria is a vector-borne disease spread through the bite of an infected Anopheles mosquito.

• Malaria symptoms include fever, rashes, aches, and nausea

• Cholera is transmitted through food and water contaminated with the causative agent Vibrio cholerae, a bacterium.

• Mumps is caused by a paramyxovirus and is characterized by fever and malaise

• Viruses, bacteria, and fungi can cause pneumonia

31. Ans. C.

• Soil formation include five factors associated with it and they are-

• Biotic Agents

• Parent Material

• Climate

• Topography or relief features

• Time

• Biotic Agents involve organisms like flora, fauna, and microorganisms that help in the process of soil formation and its enrichment.

• Parent material for the soil is derived from the weathering of stones by river streams that get deposited. Various properties like mineral composition, shape, size, etc are inherited by the soil at this stage

• Climate also plays a leading role in the weathering process of the soil

• Relief, Altitude, and Slope all come under the topography. This factor helps in modifying the effects of climate by affecting the soil processes, distribution, and the type of vegetation indirectly.

32. Ans. B.

• Photosynthesis is a process by which autotrophs or green plants convert light energy into chemical energy stored in the form of sugars.

• The chemical energy is created from water and carbon dioxide.

• The process of photosynthesis takes place in the chloroplasts with the help of pigments such as chlorophyll a, chlorophyll b, carotene and xanthophyll

• Oxygen is liberated as a by-product of photosynthesis along with glucose and fructose

• These sugars are exported to various parts of the plants like leaves, roots, stems and are responsible for their growth.

33. Ans. A.

• **Sleepwalking is another name for the disorder called 'parasomnia'**.

• It is an **undesirable behavior or experience during sleep**.

• It occurs **early in the night often one to two hours after falling asleep** and It is **unlikely to occur during naps**.

• **Stammering** is a **neurological condition that makes it physically hard to speak**.

• **Seasickness** occurs due to a **complex physiological reaction to motion**.

• **Night blindness** is **poor vision at night or in dim light** and the most common cause of **night blindness is Vitamin A deficiency**.

34. Ans. C.

• **There are 27 bones in the human hand**.

• The three different types of bones found in the human hand are:

a) **Phalange Bones**

b) **Metacarpal Bones**

c) **Carpal Bones**

• There are **14 Phalange bones** that are **found in the fingers of each hand**.

• There are **5 Metacarpal bones that compose the middle part of the hand**.

• There are **8 Carpal bones that create the wrist**.

35. Ans. C.

• **Tiny pores present on the surface of leaves are known as Stomata**.

• They are also **found in the epidermis of leaves**, **stems,** and **other plant organs.**

• They allow **gases to diffuse into** and **out of the internal tissues of the plant**.

• **A membrane-bound organelle that contains the cell's chromosomes** is called **Nucleus**.

• **A thick solution that fills each cell** and **is enclosed by the cell membrane** is called **Cytoplasm**.

• **Mitochondria** are known as the **Powerhouse of the cell**.

36. Ans. A.

• **Urobilin is responsible for the yellow colour in urine**.

• **Albumin** is a **protein made by your liver** and It **helps keep fluid in your bloodstream**.

• It also **carries various substances throughout your body**, **including hormones**, **vitamins** and **enzymes**.

• **Bilirubin** is a **yellowish pigment** and is **made during the normal breakdown of red blood cells**.

• **Creatinine** is a **waste product that comes from the normal wear** and **tears on the muscles of the body**.

• It is **released at a constant rate by the body**.

37. Ans. C.

• Diseases and their causes are as follows-

Disease	Cause
Buruli Ulcer	Bacteria Mycobacterium ulcerans
Schistosomiais	Parasitic worms. Ex. Infection with Schistosoma mansoni, S. haematobium, and S. japonicum
Trachoma	Bacteria Chalamydia Trachomatis
Diabetes	Genes and environmental factors, such as viruses, that might trigger the disease

38. Ans. C.

* The **systolic blood pressure** measures the pressure in the arteries when heart beats.

* Systolic blood pressure is when the b**lood pressure inside the arteries is maximum**

* The **diastolic blood pressure** measures the pressure in the arteries when heart rests between beats.

* Diastolic blood pressure is **blood pressure inside the arteries is minimum.**

* The normal systolic pressure is about **120 mm of Hg** and diastolic pressure is **80 mm of Hg**.

39. Ans. C.

• Vitamin B12 is generally NOT present in Plant products.

• It is also known as cobalamin and It is one of eight B vitamins.

• It is a water-soluble vitamin involved in metabolism.

• It is important in the normal functioning of the nervous system.

• It is a cofactor in DNA synthesis.

• It plays an essential role in red blood cell formation, cell metabolism, nerve function and the production of DNA.

40. Ans. C.

Alzheimer disease is a neurological disorder in which the death of brain cells causes memory loss and cognitive decline .it is caused in human due to deficiency of acetylcholine.

More Details-

• Glutamic acid (symbol Glu or E; the ionic from is known as glutamate) is an amino acid that is used by almost all living begins in the biosynthesis of proteins. It is non-essential in humans, meaning that the body can synthesize it.

• Dopamine is a type of neurotransmitter your body makes it, and your nervous system uses it to send messages between nerve cells that's why it's sometimes called a chemical messenger. Dopamine plays a role in how we feel pleasure . It's big part of our unique human ability to think and plan.

• Acetylcholine (ACh) is an abundant neurotransmitter in the human body . it is found in both the central nervous system (CNS) and the Peripheral nervous system (PNS).

41. Ans. D.

• **Leprosy is not a viral disease**.

• It is a **long-term infection by the bacteria Mycobacterium leprae** and It is also known as **Hansen's disease**.

• It can **lead to damage of the nerves**, **respiratory tract**, **skin** and **eyes**.

• It can **spread between people, although extensive contact is necessary**.

• **Smallpox** is a **contagious**, **disfiguring** and **often deadly disease**.

• **Rabies** is a **viral disease** and It causes **inflammation of the brain in humans** and **other mammals**.

• **Measles** is a **highly contagious infectious disease caused by the measles virus**.

42. Ans. C.

Gene was first isolated by Har Govind Khodana

43. Ans. D.

• The brain gets energy from glucose.

• Glucose is a simple sugar with the molecular formula $C_6H_{12}O_6$.

• It is the most abundant monosaccharide and is the most abundant carbohydrate in the world.

• It is mainly made by plants and most algae during photosynthesis from water and carbon dioxide.

• It is the most important source of energy in all organisms.

• Fatty acids are the building blocks of the fat in our bodies.

• Nucleic acid is an important class of macromolecules found in all cells and viruses.

44. Ans. B.

• **The spleen is a large bean-shaped lymphoid organ in the human body**.

• This organ is fo**und in all vertebrates**.

• It plays **important role in regard to red blood cells** and the **immune system**.

• It **removes old red blood cells** and **holds a reserve of blood**.

• A specialized primary lymphoid organ of the immune system is called **Thymus**.

• A kidney-shaped organ of the lymphatic system is called **Lymph Node**.

• The fleshy pads located at each side of the back of the throat are called **Tonsils**.

45. Ans. B.

Photosynthetic Pigments

There are four different types of pigments present in leaves:

1. Chlorophyll a

2. Chlorophyll b

3. Xanthophylls

4. Carotenoids

46. Ans. D.

Folic acid is an essential nutrient for a woman during her initial stages of pregnancy to prevent defects. It is used to treat a type of anemia where you have too few red blood cells because you have too little folic acid in your body. Iron is needed to produce the red blood cells that carry oxygen around your body. Fruit kiwi is a good source of folic acid, and other green vegetables, beans, peanut, sunflower seeds are the source of folate.

Vitamin D is fat-soluble, and it is responsible for increasing intestinal absorption of calcium, magnesium, and phosphate, it also makes bone and teeth strong.

Ascorbic acid or vitamin C prevents the levels of vitamin C in the body. Low levels of vitamin C results in scurvy and bone healing.

Water is an inorganic, transparent, tasteless, odorless, and also colorless chemical substance. It is essential to the human body and also helps in temperature regulation, maintaining bodily functions.

47. Ans. D.

• **Leukopenia** is a condition where a person has a **reduced** number of **white blood cells**. This increases the **risk** of **infections**.

• A person's **blood** is made up of many different types of **blood cells**. White blood cells, also known as **leukocytes**, help to fight off **infection**. Leukocytes are a vital part of the **immune system**.

48. Ans. B.

• **Amylase** is an **enzyme** that catalyses the hydrolysis of **starch** into **sugars**. It is present in the saliva of **humans** and some **other mammals**, where it begins the chemical process of **digestion**.

• Foods that contain large amounts of **starch** but **little sugar**, such as **rice** and **potatoes**, may acquire a slightly sweet taste as they are chewed because **amylase** degrades some of their **starch** into **sugar**.

49. Ans. D.

• Deficiency of vitamin A causes Night blindness, xerophthalmia and terror of infection.

• Vitamin A can be obtained by carrot, green vegetable, milk, egg, liver etc.

• The appearance of red-eye and tricking of the tongue is the disease caused by deficiency of vitamin B2

• Rickets and osteomalacia are caused by a deficiency of vitamin D.

• Lack of reproduction is caused by deficiency of vitamin E.

• Vitamin D is called a hormonal vitamin and vitamin E is called a beauty vitamin.

50. Ans. D.

• **Rh factor of blood groups was dicovered by Landsteiner and Wiener in 1937.**

• The term "Rh" was originally an abbreviation of "Rhesus factor."

•Since that time a number of distinct Rh antigens have been identified, but the first and most common one, called RhD, causes the most severe immune reaction and is the primary determinant of the Rh trait.

51. Ans. D.

• **T-cells recognise and kill virus-infected cells directly & B-cells make antibodies, which circulate and bind to antigens.**

• The immune system is an integral part of human protection against disease, but the normally protective immune mechanisms can sometimes cause detrimental reactions in the host. Such reactions are known as hypersensitivity reactions.

• Hypersensitivity is mediated by antibodies formed by T and B cells. Such as Antibody IgM, Antibody IgG, Antibody IgE etc.

52. Ans. C.

• **Lipases that are used in fat digestion is secreted by Pancreas.**

• Lipases performs vital role:

a) In digestion.

b) In transport and processing of dietary lipids.

c) In Biotechnology as Biocatalysts.

d) In alternate energy strategies to convert vegetable oil into fuel.

• Blood tests for lipase may be used to help investigate and diagnose acute pancreatitis and other disorders of the pancreas.

53. Ans. B.

- **Hepatitis is a virus-caused disease.**
- Other causes include heavy alcohol use, medications, toxins, infections & autoimmune diseases.
- It is an inflammation of the liver.
- There are 5 main hepatitis viruses, referred to as types **A, B, C, D and E.**

54. Ans. D.

• Trachoma is caused by the bacterium **Chlamydia trachomatis**.

• It is a type of infection which causes a roughening of the inner surface of the eyelids.

• As the infection progresses, it causes eye pain and blurred vision.

55. Ans. D.

• **A person with the Bombay Blood group(HH) can receive blood from a person who is from Bombay blood group (HH)people.**

• It is also called the HH blood type or Rare ABO blood group.

• The peculiarity is that they do not express the H antigen. As a result they cannot form A antigens or B antigens on their red blood cells.

• Thus they can donate blood to anybody with ABO grouping but can receive blood only from Bombay blood group people.

56. Ans. D.

The Active Transport is movement of ions or molecules across a cell membrane into a region of higher concentration with the help of enzymes and requiring energy.

There are 4 types of Active Transport:-

a) Antiport Pumps

b) Symport Pumps

c) Endocytosis

d) Exocytosis

57. Ans. A.

* Osmosis is the movement of a solvent across a **semipermeable membrane** .

* Osmosis takes place towards a higher concentration of solute (lower concentration of solvent).

* Osmosis can occur in other liquids, supercritical liquids, and even gases.

58. Ans. B.

* Glycolysis is a metabolic pathway that functions with or without presence of oxygen.

* In humans, in aerobic conditions this process produce pyruvate and in anaerobic conditions produce **lactate**.

59. Ans. C.

* **Cell membrane** is a biological membrane that separates the interior of all cells from extracellular space.

* It controls the movement of substances in and out of cells and organelles.

* It also helps in anchoring the cytoskeleton to provide shape to the cell.

60. Ans. A.

Major source of calcium includes – Dates, spinach, almonds, soybeans eggs, beans, lentils milk, and all other dairy products. Calcium is a nutrient that all living organisms need, including humans. It is the most abundant mineral in the body, and it is vital for bone health. Humans need calcium to build and maintain strong bones, and 99% of the body's calcium is in the bones and teeth.

61. Ans. C.

Some plants have lost their capacity to photosynthesise during evolution and are therefore dependent on other plants totally or partially, such plants are cuscuta, Raffalesia and Striga whereas an insectivorous plant is one that captures and digests small insects. They often grow in nitrogen-deficient habitats and have, therefore, evolved mechanisms to capture small insects and use them as a source of nitrogen.

62. Ans. D.

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• Budding is a process of asexual reproduction, which is most frequently related in both multicellular and unicellular organisms.

• In this process, a new individual grows from the certain generative bodily point of the parent organism.

• Several metazoan animals such as cnidarians species frequently reproduce by the process of budding.

• Bacteria, yeast, corals, flatworms, Jellyfish and sea anemones are several animal species that reproduce through budding. Virus does not show budding.

63. Ans. B.

Out food contains simple and conjugated proteins. Albumin, globulin, actin, myosin, collagen, insulin etc. are common example of simple proteins. Casein of milk, haemoglobin of blood etc. are conjugated proteins.

64. Ans. A.

There are plants for which flowering is either quantitatively or qualitatively dependent on exposure to low temperature. This phenomenon is termed vernalisation. It prevents precocious reproductive development late in the growing season and enables the plant to have sufficient time to reach maturity. Vernalisation refers specially to the promotion of flowering by a period of low temperature. Hence, option A is correct.

65. Ans. A.

Vitamin K helps to make various proteins that are needed for blood clotting and the building of bones. Prothrombin is a vitamin K-dependent protein directly involved with blood clotting. Osteocalcin is another protein that requires vitamin K to produce healthy bone tissue.

Vitamin K is found throughout the body including the liver, brain, heart, pancreas, and bone. It is broken down very quickly and excreted in urine or stool. Because of this, it rarely reaches toxic levels in the body even with high intakes, as may sometimes occur with other fat-soluble vitamins.

66. Ans. C.

Statement 1 is correct: The Golgi apparatus consists of a system of membrane-bound vesicles (flattened sacs) arranged approximately parallel to each other in stacks called cisterns. These membranes often have connections with the membranes of ER and therefore constitute another portion of a complex cellular membrane system.

Statement 2 is correct: Lysosomes are membrane-bound sacs filled with digestive enzymes. These enzymes are made by RER. Lysosomes are a kind of waste disposal system of the cell. These help to keep the cell clean by digesting any foreign material as well as worn-out cell organelles.

67. Ans. C.

Statement 1 is correct: The Protista group includes many kinds of unicellular eukaryotic organisms. Some of these organisms use appendages, such as hair-like cilia or whip-like flagella for moving around. Their mode of nutrition can be autotrophic or heterotrophic.

Statement 2 is correct: The Monera organisms do not have a defined nucleus or organelles, nor do any of them show multi-cellular body designs. On the other hand, they show diversity based on many other characteristics.

68. Ans. C.

Statement 1 is correct: The cytoplasm is the fluid content inside the plasma membrane. It also contains many specialised cell organelles. Each of these organelles performs a specific function for the cell.

Statement 2 is correct: The endoplasmic reticulum (ER) is a large network of membrane-bound tubes and sheets. It looks like long tubules or round or oblong bags (vesicles). The ER membrane is similar in structure to the plasma membrane. There are two types of ER– rough endoplasmic reticulum (RER) and smooth endoplasmic reticulum (SER).

69. Ans. D.

Pancreas is both endocrine and exocrine gland. The pancreas is unique in that it's both an endocrine and exocrine gland. In other words, the pancreas has the dual function of secreting hormones into blood (endocrine) and secreting enzymes through ducts (exocrine). organs release their products (usually hormones) directly into the blood.

The pancreas contains islets of Langerhans which are made up of alpha and beta cells. Beta cells secrete insulin and alpha cells secrete glucagon. The islets of Langerhans monitor blood glucose concentration. Insulin and glucagon are hormones that help maintain a healthy blood glucose concentration.

Exocrine organs release secretions through a duct. The pancreas is an exocrine gland because nervous or hormonal stimulation causes pancreatic secretions to be released into the duodenum through a duct.

70. Ans. A.

ADH is also called arginine vasopressin. It's a hormone made by the hypothalamus in the brain and stored in the posterior pituitary gland. ADH constantly regulates and balances the amount of water in your blood.

More Details- Oxytocin is a hormone produced by the hypothalamus and secreted by the pituitary gland. This important hormone plays a crucial role in the childbirth process and also helps with male reproduction.

Estrogen is one of two main sex hormones that women have and the other one is progesterone. Estrogen is responsible for female physical features and reproduction.

Testosterone is the main sex hormone found in man. It controls male physical features. The testes (testicles) make testosterone. Women have testosterone too but in much smaller amounts than in men.

71. Ans. B.

The liver controls the amino acid concentration in the body, as excess amino acids which need to be excreted safely.

More Details-The kidney's job is to filter your blood .They remove wastes ,control the body's fluid balance, and keep the right levels of electrolytes .All the blood in your body passes through them about 40 times a day.

The spleen plays multiple supporting roles in the body .It acts as a filter for blood as part of the immune system .Old red blood cells are recycled in the spleen, and platelets and white blood cells are stored there. The spleen also helps fight certain kinds of bacteria that cause pneumonia and meninghits.

The rectum is a chamber that begins at the end of the large intenstine at the end of the large intestine,Immediately following the sigmoid colon, and ends at the anus. Ordinarily ,the rectum is empty because stool is stored higher in the descending colon.

72. Ans. C.

Hematopoiesis or Hemopoiesis is the process of formation of blood cellular components .All the cellular blood components are derived from hematopoietic stem cells.

More Details- Hemolysis is the destruction of red blood cells prior to the end of their normal 120 day lifespan and should be considered in anaemic patients with risk factors or no obvious cause of anaemia serum markers may be used to diagnose haemolysis and suggest a cause .

Hemozoin is a crystalline brown pigment that is formed and sequestered in the digestive vacuole of plasmodium as a product of hemoglobin (Hb) catabolism(57).The parasite digests up to 80% of the Hb in the host RBC, which it utilizes as an essential source of nutrients and energy.

73. Ans. D.

Pituitary gland is the smallest endocrine gland in the human body which sits in a bony hollow called the pituitary fossa Its weight is only about 0.5 gram and diameter is about 10mm (like size of pea).It is famous 'master gland 'because most of its hormones control the activity levels of other endocrine glands It is also called hypophysis cerebri Smallest endocrine gland in the human body is the pineal gland which is cone shaped and about 7.5 mm in size.

More Details- The thyroid gland is an endocrine gland in your neck It is makes two hormones that are secreted into the blood Thyroxine and triiodothyronine These hormones are necessary for all the cells in your body to work normally.

The pancreas is a glandular organ in the upper abdomen but really it serves as two glands in one ; a digestive exocrine gland and a hormone producing endocrine gland.

The pituitary gland is a small pea -sized gland that plays a major role in regulating vital body functions and general wellbeing It is reffered to as the body's master gland ' because it controls the activity of most other harmone secreting glands

74. Ans. D.

Diffusion is the only process through which much needed oxygen is supplied to all the cells of the plants. Diffusion occurs in roots, stems and leaves. Respiration in roots: Roots of the plant take oxygen from the air that is present in-between the particles of soil.

More Details- Endosmosis is the movement of the water inside the cells when the cell is placed in a hypotonic solution. This movement of water causes the cell to swell

When a cell is placed in a hypertonic solution, the water moves out of the cell and the cell becomes flaccid. This movement of water out of the cell is known as Exosmosis.

Photosynthesis is the process by which plants use sunlight, water and carbon dioxide to create oxygen and energy in the form of sugar .

75. Ans. C.

Golgi apparatus is also known as Golgi complex or Golgi body. It is an organelle that serves as primary packaging area for molecules that will be distributed throughout the cell. It is located in the cytoplasm next to the endoplasmic reticulum and near the nucleus of the cell.

More Details- Mitochondria are organelles or parts of a eukaryote cell. They are in the cytoplasm not the nucleus.

The plastid is a membrane bound organelle found in the cells of plants algae and some other eukaryotic organisms .

A vacuole is a membrane bound organelle They are kind of vesicles . Vacuoles are closed sacs made of membranes with inorganic or organic molecules inside such as enzymes.

76. Ans. A.

• Corpus luteum is a mass of cells that forms in an ovary and is responsible for the production of the hormone progesterone during early pregnancy. The role of the Corpus luteum depends on whether or not fertilization occurs.

More Details-

The ovary is an organ found in the female reproductive system that produces an ovum. When released this travels down the fallopian tube into the uterus where it may become fertilized by a sperm There is an ovary found on each side of the body.

77. Ans. B.

• Blue green algae is used mainly in paddy crops for the supply of nitrogen as a bio fertilizer. These microorganisms encourage plant growth by producing plant growth elements.

78. Ans. D.

The common cold also known as simply as a cold is a viral infectious disease of the upper respiratory tract that primarily affects the respiratory mucosa of the nose, throat ,sinuses and larynx .signs and symptoms may appear less than two days after exposure to the virus .

More Details-

A serious disease that makes your muscles ,especially the muscles of your face hard and impossible to move.it is caused by bacteria entering the body through cuts or wounds

A serious disease that passes from one person to another by sexual contact.

A serious disease that causes stomach pains and vomiting and can cause death. Cholera is most common in hot countries and is carried by water.

79. Ans. A.

Lymphocytes produce antibodies in blood plasma and are responsible for inactivating poisonous substances. Lymphocytes are very small white blood cells with large nucleus wanders in the whole body and their number is large in total W.B.C count (about 20-25%) like an army, Lymphocytes protect the body by coordinating with all parts of the immune system. Lymphocytes include natural killer cells, T cells and B cells which are the major cellular components of the immune response.

80. Ans. D.

• **Venation is the pattern of veins in the blade of a leaf**.

• It is of three types:

a) **Reticulate**

b) **Parallel**

c) **Furcate**

• **Leaves** are an **important part of the plants responsible for photosynthesis**.

• **Cytology** is a **branch of biology that studies the structure**, **function** and **behaviour of cells**.

• **Morphology** is a **branch of biology dealing with the study of the form** and **structure of organisms** & **their specific structural features**.

• **The anthology** is a **collection of the literary works chosen by the compiler**.

81. Ans. D.

• **A breathing root is not a storage root**.

• **Conical root**, **Napiform root**, **Fusiform root** are **storage roots**.

• The **function of storage roots** is to **store the extra nutrients that a plant collects or makes**.

• **The fusiform root** is the **modification of taproot for food storage**.

• **Napiform roots** are **spherical in shape at the upper part** and they are **sharply tapering towards the tip of the root**.

• They are the **modifications of taproot** which become **swollen** and **spherical at the upper end**.

82. Ans. C.

• **Diphtheria is caused by bacteria**.

• It is a **serious bacterial infection that usually affects the mucous membranes of your nose** and **throat**.

• It is caused by the **bacterium Corynebacterium diphtheriae**.

• It is **usually spread between people by direct contact or through the air**.

• **Rubella** is a **contagious disease caused by a virus** and It occurs **most often in children** and **young adults**.

• **Polio** is an **infectious disease caused by the poliovirus**.

83. Ans. D.

• **The supply of food to plant parts from the soil does not figure among the main functions of the root system of a plant**.

• The main functions of the root system are:

a) **Absorption of water**

b) **Absorption of minerals from the soil**

c) **Providing a proper anchorage to the plant parts**

d) **Storing reserve food material**

e) **Synthesis of plant growth regulators**

• **Roots** are the **organs of a plant that allows plants to grow taller** and **faster**.

• There are two main types of root systems:

a) **Taproot system**

b) **Fibrous root system**

• **Root system growth in plants** is **important for structural support** and **water** & **nutrient absorption**.

84. Ans. B.

• **The vertebrae are a part of Spinal cord**.

• They are the **33 individual**, **interlocking bones that form the spinal column**.

• The **spinal cord** is a **long**, **thin**, **tubular structure made up of nervous tissue**.

• The **Lungs** are the **primary organs of the respiratory system in humans** and they are **only fully developed in early childhood**.

• The **kidneys** are **two reddish-brown bean-shaped organs found in vertebrates**.

• The **heart** is a **muscular organ** which **pumps blood through the blood vessels of the circulatory system**.

85. Ans. B.

• **The stomach secretes hydrochloric acid that helps our body in killing pathogenic bacteria**.

• It is a **muscular organ located on the left side of the upper abdomen**.

• The **kidneys** are **two reddish-brown bean-shaped organs found in the vertebrates**.

• They **remove waste** & **extra water from the blood** and **help keep chemicals balanced in the body**.

• The **brain** is **one of the largest** and **most complex organs in the human body**.

• It is **made up of more than 100 billion nerves that communicate in trillions of connections**.

86. Ans. B.

• **The part of the body which is associated with the rickets disorder is the Bones.**

• **Rickets** causes **bone pain and muscle weakness** in **children.**

• It is caused due to the deficiency of **Vitamin D** or **calcium** in a child.

• Sources of **Vitamin D** are **sunlight** and **food such as fish liver oil, milk, eggs** etc.

• Sources of **Calcium** are dairy products such as **milk, cheese and yoghurt**, and **green vegetables** such as **broccoli and cabbage**.

87. Ans. D.

• **Lenticles are the small pores on Bark of tree.** Lenticles are found as raised circular, oval, or elongated areas on stems and roots.

• The gaseous exchange between the stem and the atmosphere take place through Lenticles.

• Stomata are tiny pores available on the surface of leaves of plants. The exchange of gases in the leaves during respiration takes place through stomata.

88. Ans. B.

• **A nephron is the structural and functional unit of the kidney**.

• It is **composed of a renal corpuscle** and **a renal tubule**.

• The **kidneys** are **two reddish-brown bean-shaped organs found in vertebrates**.

• They are **located on the left** and **right in the retroperitoneal space**.

• **The medulla** is the **lowest part of the brain** and the **lowest portion of the brainstem**.

• **The cortex** is the **outer surface of the cerebrum** and **is composed of grey matter**.

• **The ureter** is a **tube that carries urine from the kidney to the urinary bladder**.

89. Ans. B.

• **There are two arteries in an umbilical cord.**

• **The umbilical cord** is a **tube that connects the unborn baby (fetus) to its mother during pregnancy**.

• It supplies **oxygen and nutrients** to the baby and also **carries away the baby's waste products**.

• There are **three blood vessels** in the **umbilical cord**, **one vein** that carries **food and oxygen** to the baby and **two arteries** that carry **waste from the baby** back to the placenta.

• **Blood vessels** are the part of **blood circulatory system**. There are mainly **three** types of blood vessels: **arteries, veins and capillaries.**

90. Ans. D.

• **A plague is not a disease caused by a virus**.

• It is a **disease that affects humans** and **other mammals**.

• It is an **infectious disease caused by the bacterium, Yersinia pestis**.

• There are **three forms of plague**:

a) **Pneumonic plague**

b) **Bubonic plague**

c) **Septicemic plague**

• **Zika virus** is a **mosquito-borne flavivirus** and It was **first identified in Uganda**.

• **Ebola** is a **viral hemorrhagic fever in humans** and **other primates**.

91. Ans. D.

• The impact of Eutrophication includes-

a) Depletion of Biodiversity

b) Depletion of Dissolved Oxygen

c) Toxicity

d) Algal boom, etc.

• Mitigation of Eutrophication includes- Ripparian buffer, Nitrogen testing, depletion of point sources of industrial waste, control agricultural waste etc.

92. Ans. C.

• **Biosphere is the largest ecosystem of the earth.**

• Biosphere is life zone of earth or part of earth where life exists. It represents integrated and interacting zone comprising of atmosphere, hydrosphere and lithosphere.

• The energy required to support life in Biosphere comes from sun and the necessary nutrients come from soil, air and water.

93. Ans. C.

• The process of water being overly enriched with minerals and nutrients leading to the excessive growth of algae is known as **Eutrophication** while the extraordinary excessive growth is termed as **Algal Boom.**

• The process of Eutrophication leads to oxygen depletion of water body.

• It is caused primarily by discharge of nitrates or phosphate containing detergents, sewage etc into an aquatic system.

• The depleted oxygen levels have effects on biodiversity & have adverse reaction to aquatic life.

94. Ans. D.

• The tuberculosis vaccine was developed over a period of 13 years, from 1908 to 1921 **by Albert Calmette and Camille Guerin,** who named the product Bacillus Calmette-Guerin, or BCG.

• Tuberculosis is an infectious disease usually caused by Mycobacterium tuberculosis (MTB) bacteria. Tuberculosis generally affects the lungs, but can also affect other parts of the body.

95. Ans. B.

• **Urochrome is yellow pigment present in Urine.** It is also known as Urobin.

• Urochrome is generated from degradation of heme, which is first degraded from Bilrubin.

• Many urine tests monitor the amount of urobilin in urine, as its levels can give insight on the effectiveness of urinary tract function.

• A dark coloured urine with a low urochrome concentration is a symptom of obstructive jaundice.

96. Ans. C.

• **A Vector is any agent which carries the infectious pathogen from one person to another person**.

• Arthropods form a major group of pathogen vectors with mosquitoes, flies, sand flies, lice etc. & the most common example is Anopheles mosquito which carries malaria parasite from one place to other.

• Some plants and fungi act as vectors for various pathogens.

97. Ans. A.

• Diptheria is a bacterial disease which **affects mucus membrane of nose and throat.**

• As a result it blocks the airway, causing you to struggle for breath.

• Diphtheria can be prevented through the use of vaccines.

98. Ans. A.

* **Amblyopia is the most common cause of visual impairment among children**.

* Amblyopia can occur when one eye is more nearsighted, more farsighted or has more astigmatism.

* Amblyopia occurs in early childhood when nerve pathways between the brain and an eye aren't properly stimulated, the brain favours the other eye.

* These terms refer to the ability of the eye to focus light on the retina.

99. Ans. D.

• **The glomerulus, proximal tubule, distal tubule are all located in the cortex (outer portion) of the kidney.**

• It is the region where the osmolarity of the interstitial fluid is relatively low.

100. Ans. A.

Apoptosis is the process of programmed cell death (PCD) that may occur in multicellular organisms. Apoptosis plays a crucial role in developing and maintaining the health of the body by eliminating old, unnecessary, and unhealthy cells.

• Aging is the process during which structural and functional changes accumulate in an organism as a result of the passage of time. The changes manifest as a decline from the organism's peak fertility and physiological functions until death.

Hence the correct option is A.

101. Ans. C.

An osteoma is a new piece of bone usually growing on another piece of bone typically the skull. It is a benign tumor. When the bone tumor grows on other bone tumor grows on other bone t is known as "homoplastic osteoma "when it grows on other tissue it is called "heteroblastic osteoma.

• sarcoma-A sarcoma is a malignant tumor, a type of cancer that arises from transformed cells of mesenchymal (connective tissue) origin.

• Myeloma- cells are abnormal plasma cells (a type of white blood cells) that build up in the bone marrow and form tumors in many bones of the body .

Hence the correct option is C.

102. Ans. C.

A Chloroplast is an organelle within the cells of plants and certain algae that is the site of photosynthesis, which is the process by which energy from the sun is converted into chemical energy for growth.

• An organelle found in large numbers in most cells, in which the biochemical processes of respiration and energy production occur.

• A complex of vesicles and folded membranes within the cytoplasm of most eukaryotic cells, involved in secretion and intracellular transport.

• The ribosome is a complex molecule made of ribosomal RNA molecules and proteins that form a factory for protein synthesis in cells The ribosome is responsible for translating encoded messages from messenger RNA molecules to synthesize proteins from amino acids.

Hence the correct option is C.

103. Ans. B.

Epithelial Tissue is a type of body tissue that forms the covering on all internal and external surfaces of your body

● Adipose Tissue -is derived from preadipocytes.

● Muscular Tissue- It is a soft tissue that connects the muscles of the body and has the ability to shorten or contract in order to produce movement of the body parts.

● Areolar Tissue-It is loose connective tissue It acts as a reservoir of water and salts for surrounding tissues.

Hence the correct option is B.

104. Ans. B.

Transfer of pollen grains from the anther to stigma of another flower of the same plant is called geitonogamy . It is a type of self Pollination.

Hence the correct option is B.

● Autogamy -Transfer of pollen grains from the other to the stigma of the same flower is known as autogamy or self pollination.

● Xenogamy -is the transfer of pollen grains from the anther to the stigma of a different plant.

Hence the correct option is B.

105. Ans. B.

Mollusca is the second largest phylum of invertebrate animals after the Arthropoda. The members are known as molluscs or mollusks.

They are bilaterally symmetrical

They are triploblastic, with three layers.

Body is covered by a mantle and shell.

The body is soft and unsegmented, Ex- clams ,cuttlefish ,squid,octopus, mussels etc.

● Echinodermata examples are starfish ,sea urchins,crinoids,brittlestars,etc.

● Annelida examples are earthworms ,leech,clitellata,polychaete,etc

● Pisces examples are bluefish, goldfish ,guppy, common carp etc.

Hence the correct option is B.

106. Ans. C.

Dolphins have the highest brain to body weight ratio of all cetaceans.

Hence the correct option is C.

107. Ans. A.

bryophytes are often referred to as the amphibians of the plant kingdom . bryophytes are small, non-vascular plants. Bryophytes are generally classified into three coordinate phyla namely the liverwurst, hornworts and mosses.

• Phanogrames are the plants that have seeds. They are also known as spermatophytes. The plant body is differentiated into root, stem ,and leaves.

• Pteridophyte is a division of flowerless green plants that comprises the ferns and their relatives .

• Thallophytes are a polyphyletic group of non-mobile organisms that are grouped together on the basis of similarity of characteristics but do not share a common ancestor.

Hence the correct option is A.

108. Ans. B.

Collenchyma is a specialized simple permanent tissue that provides support and flexibility to plants.

• Parenchyma is the bulk of functional substance in an animal organ or functional substance in an animal organ or structure such as a tumor .

• Sclerenchyma is a lignified suppurative tissue made up of thick walled and lignified cells.

Hence the correct option is B.

109. Ans. C.

Lateral meristem is present on the lateral sides of stems and roots . It helps in increasing the girth of stem and root.

Hence the correct option is C.