**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2014**

1. **The lowest level of organization in living organisms is:**

**A.** organ

**B.** cell

**C.** system

**D.** tissue

**Answer:** B. cell  
The cell is the basic structural and functional unit of all living organisms.

1. **Which of the following is the most complex according to their cellular level of organization?**

**A.** Heart

**B.** Hair

**C.** Euglena

**D.** Hydra

**Answer:** A. Heart  
The heart is a highly complex organ made up of various tissues and specialized cells, making it more complex than individual organisms like Euglena or Hydra at the cellular level.

1. **Which of the following organisms is multicellular?**

**A.** Chlamydomonas

**B.** Spirogyra

**C.** Amoeba

**D.** Euglena

**Answer:** B. Spirogyra  
Spirogyra is a multicellular organism, unlike Chlamydomonas, Amoeba, and Euglena, which are unicellular.

1. **In bryophytes, sex organs are produced in the:**

**A.** protonema

**B.** sporophyte

**C.** gametophyte

**D. rhizoid**

**Answer:** C. gametophyte  
In bryophytes, the gametophyte stage produces the male and female sex organs (antheridia and archegonia).

1. **Seed plants are the most dominant vegetation on land because of:**

**A.** their motile gamates

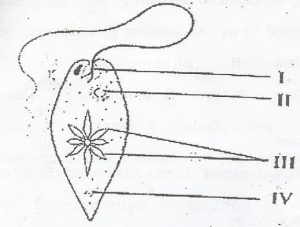
**B.** their ability to photosynthesize

**C.** efficient seed dispersal

**D.** availability of water

**Answer:** C. efficient seed dispersal  
Seed plants have evolved efficient mechanisms for seed dispersal, allowing them to thrive in various environments and dominate land vegetation.

1. **Which of the following is an arboreal organism?**  
   **A.** Elephant  
   **B**. Fish  
   **C**. Antelope  
   **D**. Bird  
   **Answer:** D. Bird  
   Birds are arboreal organisms because they live and often nest in trees.
2. **i2/1, c0/0, pm3/2, m3/3. The general formula above represents that of**  
   **A**. an omnivore  
   **B.** a detritus feeder  
   **C**. a carnivore  
   **D**. a herbivore  
   **Answer:** C. a carnivore  
   The given formula represents a carnivore's feeding habits, with the "m" indicating meat consumption.
3. **A circulatory system is very essential in mammals but not in smaller organisms like Amoeba because**  
   **A**. Amoeba lives in freshwater  
   **B.** Diffusion is sufficient to transport materials in Amoeba  
   **C**. Amoeba lacks blood containing haemoglobin  
   **D**. Amoeba exhibits anaerobic respiration  
   **Answer:** B. Diffusion is sufficient to transport materials in Amoeba  
   Amoeba is small enough for diffusion to effectively transport materials across its body.
4. **In vascular plants, the sieve tubes and companion cells are present in the**  
   **A.** cambium  
   **B.** cortex  
   **C.** xylem  
   **D.** phloem  
   **Answer:** D. phloem  
   The sieve tubes and companion cells are part of the phloem, responsible for transporting food in plants.
5. **The stomata of leaves are similar in function to the**  
   **A.** pharynx of humans  
   **B.** scales of fish  
   **C.** spiracle of insects  
   **D**. trachea of toads  
   **Answer:** C. spiracle of insects  
   Stomata function similarly to spiracles, as both are openings that allow gas exchange.
6. **. The use of moist skin for respiration in amphibians is known as**  
   **A.** cellular respiration  
   **B.** cutaneous respiration  
   **C.** buccal respiration  
   **D.** pulmonary respiration  
   **Answer:** B. cutaneous respiration  
   Amphibians use their moist skin for gas exchange, a process known as cutaneous respiration.
7. **Water in plants is removed as water vapour through the process of**  
   **A.** diffusion  
   **B.** osmosis  
   **C.** evaporation  
   **D.** transpiration  
   **Answer:** D. transpiration  
   Transpiration is the process where water is lost as vapour through the stomata in plant leaves.
8. **An example of an organ of perennation in plants is**  
   **A.** rhizome  
   **B.** seed  
   **C.** petal of a flower  
   **D.** calyx of flower  
   **Answer:** A. rhizome  
   Rhizomes are underground stems that help plants survive harsh conditions and regenerate during the next growing season.
9. **Alternation of generation is a feature shown in**  
   **A.** mosses  
   **B.** fungi  
   **C.** grasses  
   **D.** conifers  
   **Answer:** A. mosses  
   Mosses exhibit alternation of generations, alternating between a gametophyte and sporophyte stage.
10. **Coordination and regulation of body activities in mammals are achieved by the**  
    **A.** nerves and muscle  
    **B.** nerves and hormones  
    **C.** nerves only  
    **D.** hormones only  
    **Answer:** B. nerves and hormones  
    Mammals use both nerves and hormones to coordinate and regulate body functions.
11. **The Cerebellum of the Brain controls**  
    **A.** Reflex Action  
    **B.** Muscular Activity  
    **C.** Emotional Expressions  
    **D.** the Endocrine System  
    **Answer:** B. Muscular Activity  
    The cerebellum is responsible for coordinating voluntary muscle movements and maintaining balance.
12. **The part of the brain responsible for peristalsis is the**  
    **A.** Olfactory Lobe  
    **B.** Medulla Oblongata  
    **C.** Hypothalamus  
    **D.** Thalamus  
    **Answer:** B. Medulla Oblongata  
    The medulla oblongata controls vital involuntary functions, including peristalsis in the digestive system.
13. **Which of the following instruments is used for measuring atmospheric pressure?**  
    **A.** Hydrometer  
    **B.** Hygrometer  
    **C.** Thermometer  
    **D.** Barometer  
    **Answer:** D. Barometer  
    A barometer is used to measure atmospheric pressure.
14. **The influence of soil on organisms in a habitat is referred to as**  
    **A.** Edaphic  
    **B.** Physiographic  
    **C.** Biotic  
    **D.** Topographic  
    **Answer:** A. Edaphic  
    Edaphic factors refer to the influence of soil conditions on organisms in a habitat.
15. **The genetic make-up of an organism is described as**  
    **A.** Allele  
    **B.** Chromosome  
    **C.** Phenotype  
    **D.** Genotype  
    **Answer:** D. Genotype  
    The genotype is the genetic constitution of an organism, representing its inherited traits.
16. **The major limiting factors of productivity in the aquatic habitat include the following except?**  
    **A.** Food  
    **B.** Temperature  
    **C.** Water  
    **D.** Sunlight  
    **Answer:** C. Water  
    Water is essential for aquatic habitats and is not a limiting factor, unlike food, temperature, and sunlight which can limit productivity.
17. **Which of the following group of organisms feeds directly on green plants?**  
    **A.** Primary Consumers  
    **B.** Secondary Consumers  
    **C.** Producers  
    **D.** Decomposers  
    **Answer:** A. Primary Consumers  
    Primary consumers are herbivores that feed directly on green plants.
18. **A characteristic feature of tropical rainforest is that it**  
    **A.** Contains trees with narrow leaves  
    **B.** Contains large number of plant species  
    **C.** Contains fewer number of plant species  
    **D.** Has total annual rainfall of less than 50cm  
    **Answer:** B. Contains large number of plant species  
    Tropical rainforests are known for their biodiversity, particularly the large number of plant species.
19. **The study of how and why population size change over time is**  
    **A.** Population estimation  
    **B.** Population dynamics  
    **C.** Population ecology  
    **D.** Population Cycle  
    **Answer:** B. Population dynamics  
    Population dynamics is the study of how and why population sizes change over time.
20. **A severe and long dry season is a characteristic feature of**  
    **A.** Sahel Savanna  
    **B.** Mangrove Swamps  
    **C.** Sudan Savanna  
    **D.** Guinea Savanna  
    **Answer:** A. Sahel Savanna  
    The Sahel Savanna is characterized by a long and severe dry season, making it distinct from other savannas.
21. **Which of the following is a nitrogen-fixing blue-green algae of soil?**  
    **A.** Rhizobium  
    **B.** Nitrosomonas  
    **C.** Clostridium  
    **D.** Anabaena  
    **Answer:** D. Anabaena  
    Anabaena is a nitrogen-fixing blue-green algae found in soil.
22. **The soil with highest water-retaining capacity is**  
    **A.** Clayey Soil  
    **B.** Stoney soil  
    **C.** Sandy soil  
    **D.** Loamy Soil  
    **Answer:** A. Clayey Soil  
    Clayey soil has the highest water-retaining capacity due to its fine particles and compact structure.
23. **The causative agent of Poliomyelitis is**  
    **A.** Virus  
    **B.** Fungus  
    **C.** Protozoan  
    **D.** Bacterium  
    **Answer:** A. Virus  
    Poliomyelitis is caused by the poliovirus.
24. **One of the ways of controlling noise pollution in urban areas is**  
    **A.** by siting industries away from residential areas  
    **B.** that fuel should be completely combusted by engines  
    **C.** by planting trees on both sides of the road  
    **D.** by wearing ear devices  
    **Answer:** A. by siting industries away from residential areas  
    Placing industries away from residential areas helps reduce noise pollution in urban settings.
25. **A constituent of the exhaust fumes from electricity generating sets which causes serious pollution is**  
    **A.** Carbon (II) Oxide  
    **B.** Water Vapour  
    **C.** Ozone  
    **D.** Carbon (IV) Oxide  
    **Answer:** A. Carbon (II) Oxide  
    Carbon (II) oxide (carbon monoxide) is a harmful component of exhaust fumes, contributing to air pollution.
26. **1. Which of the following is true of small pox?**  
    **A.** It is transmitted by bacteria  
    **B.** It can effectively be controlled with antibiotics  
    **C.** It can effectively be controlled by vaccination  
    **D.** It is a water-borne infection  
    **Answer:** C. It can effectively be controlled by vaccination  
    Smallpox can be controlled by vaccination, and it has been eradicated through this method.
27. **A pollutant that is mostly associated with acid rain is**  
    **A.** Nitrogen (IV) Oxide  
    **B.** Ozone  
    **C.** Fluorine  
    **D.** Carbon (IV) Oxide  
    **Answer:** A. Nitrogen (IV) Oxide  
    Nitrogen (IV) oxide is a primary pollutant contributing to acid rain when combined with water vapor in the atmosphere.
28. **When the adults have reached a certain degree of weakness, the process of binary fission is replaced by conjugation in**  
    **A.** Paramecium  
    **B.** Euglena  
    **C.** Amoeba  
    **D.** Plasmodium  
    **Answer:** A. Paramecium  
    Paramecium undergoes conjugation when they experience weakness, exchanging genetic material to increase genetic diversity.
29. **Whorls, arches, loops, and compounds are types of variation in**  
    **A.** Colour  
    **B.** Finger prints  
    **C.** Hair Colour  
    **D.** Blood group  
    **Answer:** B. Finger prints  
    Whorls, arches, and loops are patterns found in fingerprints, which vary among individuals.
30. **A couple has 10 children, all female. Which of the following best explains the situation?**  
    **A.** The sex determination was by the man's X chromosome  
    **B.** The man's sperm count is low  
    **C.** The woman is not capable of producing male children  
    **D.** The sex determination was by the man's Y chromosome  
    **Answer:** A. The sex determination was by the man's X chromosome  
    Since the children are all female, it suggests that the man's sperm carried only X chromosomes, resulting in all female offspring.
31. **A biological agent with antiviral property is**  
    **A.** Interferon  
    **B.** enzyme  
    **C.** antibiotic  
    **D.** disinfectant  
    **Answer:** A. Interferon  
    Interferon is a protein that has antiviral properties, helping to protect cells from viral infections.
32. **One of the advantages of outbreeding is**  
    **A.** pests tolerance  
    **B.** disease resistance  
    **C.** fast growth  
    **D.** tall height  
    **Answer:** B. disease resistance  
    Outbreeding increases genetic diversity, which can enhance disease resistance in offspring.
33. **An individual with blood group AB can receive blood from those in blood group(s)**  
    **A.** A, B, AB, O  
    **B.** A, AB and O only  
    **C.** AB only  
    **D.** A and B only  
    **Answer:** A. A, B, AB, O  
    Individuals with blood group AB are universal recipients and can receive blood from any other blood group.
34. **The streamlined shape of fishes is an adaptation for**  
    **A.** Securing mates  
    **B.** easy movement  
    **C.** obtaining food  
    **D.** defence and attack  
    **Answer:** B. easy movement  
    The streamlined shape of fish helps them move efficiently through water, reducing resistance and allowing for faster swimming.
35. **An example of a poikilothermic organism is a**  
    **A.** Lizard  
    **B.** Cockroach  
    **C.** rabbit  
    **D.** bird  
    **Answer:** A. Lizard  
    Poikilothermic organisms, like lizards, have body temperatures that vary with the temperature of their surroundings.
36. **All living organisms are constantly involved in a struggle for existence. This was proposed by**  
    **A.** Morgan  
    **B.** Darwin  
    **C.** Lamarck  
    **D.** Wallace  
    **Answer:** B. Darwin  
    Charles Darwin proposed the concept of "struggle for existence" as part of his theory of natural selection.
37. **Adaptive radiation is illustrated in**  
    **A.** modified insect mouthparts  
    **B.** dentition in mammals  
    **C.** wings in birds and bats  
    **D.** appendages in insects  
    **Answer:** C. wings in birds and bats  
    Adaptive radiation is the evolution of diverse species from a common ancestor, such as the development of wings in birds and bats for different environmental needs.
38. **i. Growth is mainly apical  
    ii. Growth is specific with definite shape  
    iii. Growth is throughout life. Which of the above correctly describes the growth pattern in plants?**  
    **A.** i, ii and iii only  
    **B.** ii and iii only  
    **C.** i and ii only  
    **D.** i and iii only  
    **Answer:** A. i, ii and iii only  
    Plants exhibit apical growth (growth at the tips), specific and definite growth patterns, and can continue growing throughout their life.



**Use the diagram to answer this question. The part labelled II is the**

**A.** nucleus

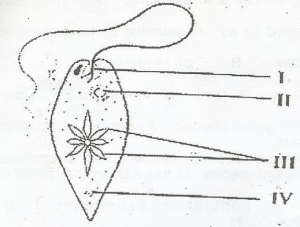
**B.** eyespot

**C.** basal granule

**D.** contractile vacuole

**Answer:** Based on the diagram, the part labeled II in this type of protist-like structure is likely to be the eyespot.

The eyespot (B) is a structure in certain protists (e.g., Euglena) that detects light, aiding the organism in phototaxis (movement toward light).



**Use the diagram above to answer this question. The part responsible for photosynthesis is labelled**

**A.** III

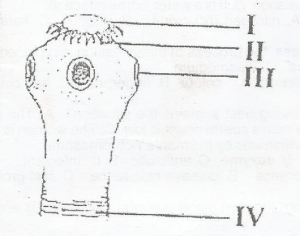
**B.** IV

**C.** I

**D.** II

**Answer:** The structure in the diagram above represents Euglena. The part responsible for photosynthesis would be the chloroplast, which is typically labeled III. The answer is A. III

**46.**



**Use the diagram above to answer this question. The young proglottid is represented by**

**A.** III

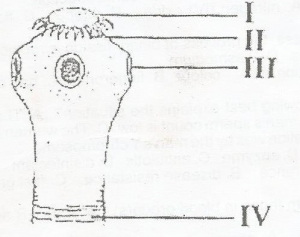
**B.** IV

**C.** I

**D.** II

**Answer:** The diagram above represent a tapeworm, where the young proglottid (newly formed reproductive segment) is typically located near the neck region just below the scolex (head). This would correspond to II. The answer is D. II.

**47.**



**In the diagram, the organs for attachments to the lining of the host's intestine are labelled**

**A.** ii and iii

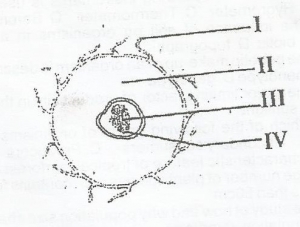
**B.** iii and iv

**C.** i and ii

**D.** i and iii

**Answer:** the organs for attachment to the lining of the host's intestine are typically the hooks and suckers, which are located on the scolex (the head of the tapeworm). These would correspond to parts I (hooks) and III (suckers). Answer: D. i and iii.

**48.**



**In the diagram, the part labelled I is the**

**A.** xylem

**B.** phleom

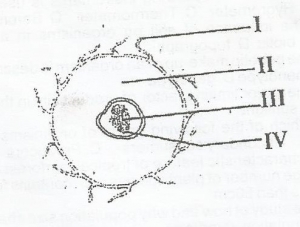
**C.** root hairs

**D.** cortex

**Answer:** The part labeled "I" in this diagram is most likely referring to root hairs, as they are extensions from the root epidermis that increase the surface area for water and mineral absorption. Therefore, the correct answer is:

C. root hairs

**49.**



**The diagram is the transverse section of a**

**A.** monocotyledonous stem

**B.** dicotyledonous stem

**C.** monocotyledonous root

**D.** dicotyledonous root

**Answer:** D. dicotyledonous root

Explanation:

* The diagram shows a transverse section with distinct parts such as the cortex, vascular tissues, and root hairs. These are characteristic of a root structure.
* In dicotyledonous roots, the xylem and phloem are arranged radially (alternating in a star-like pattern), which is typical in the diagram.
* Root hairs are also visible, indicating it's a root rather than a stem**.**

**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2015**

**1. A tissue is composed of a group of**  
**A.** similar cells  
**B.** tissues  
**C.** systems  
**D.** related organs  
**Answer:** A. similar cells  
A tissue is a group of similar cells working together to perform a specific function.

**2. The population of different organisms that exist together in a habitat is called**  
**A.** biomes  
**B.** biosphere  
**C.** community  
**D.** ecology  
**Answer:** C. community  
A community refers to the population of different organisms living together in a specific habitat.

**3. Which of the following serves as the brain box in man**  
**A.** skeleton  
**B.** skull  
**C.** head  
**D.** spinal column  
**Answer:** B. skull  
The skull is the protective structure that encases and protects the brain in humans.

**4. Which organ removes the largest amount of excess water from the body?**  
**A.** Liver  
**B.** Lung  
**C.** Kidney  
**D.** skin  
**Answer:** C. Kidney  
The kidneys are responsible for removing excess water from the body through urine.

**5. A group of organisms of the same kind inhabiting the same environment is called**  
**A.** ecosystem  
**B.** habitat  
**C.** population  
**D.** species  
**Answer:** C. population  
A population consists of individuals of the same species living in a particular area.

**6. The light-sensitive cells in the human eye is called the ................**  
**A.** Choroid  
**B.** Sclerotic layer  
**C.** retina  
**D.** cones  
**Answer:** C. retina  
The retina contains light-sensitive cells (rods and cones) that detect light and send signals to the brain.

**7. The earliest form of life in animal kingdom is the**  
**A.** aves  
**B.** amphibian  
**C.** pisces  
**D.** reptilia  
**Answer:** C. pisces  
Pisces (fishes) are the earliest and most primitive form of life in the animal kingdom.

**8. Which of the following disease is not sexually transmitted?**  
**A.** Gonorrhea  
**B.** Herpes  
**C.** Influenza  
**D.** Syphilis  
**Answer:** C. Influenza  
Influenza is a respiratory disease transmitted through airborne particles, not through sexual contact.

**9. Which of the following is not a monocotyledonous seed?**  
**A.** cowpea  
**B.** maize  
**C.** millet  
**D.** wheat  
**Answer:** A. cowpea  
Cowpea is a dicotyledonous seed, while maize, millet, and wheat are monocotyledonous.

**10. The lowest unit of classification is the**  
**A.** class  
**B.** genus  
**C.** phylum  
**D.** species  
**Answer:** D. species  
Species is the most specific and lowest unit in the biological classification hierarchy.

**11. One of the following diseases is caused by fungi**  
**A.** cassava mosaic  
**B.** coffee leaf rust  
**C.** leaf blight of cassava rossette  
**D.** Tomato mosaic  
**Answer:** B. coffee leaf rust  
Coffee leaf rust is a fungal disease caused by *Hemileia vastatrix*.

**12. The by-product of photosynthesis is**  
**A.** CO2  
**B.** O2  
**C.** C6H12O6  
**D.** H2O  
**Answer:** B. O2  
Oxygen (O2) is released as a by-product during photosynthesis.

**13. Gaseous exchange in the lungs takes place in the**  
**A.** alveoli  
**B.** bronchi  
**C.** bronchioles  
**D.** trachea  
**Answer:** A. alveoli  
The alveoli are tiny air sacs in the lungs where gaseous exchange occurs.

**14. In eukaryotic cells, cellular respiration takes place in the**  
**A.** nucleus  
**B.** cytoplasm  
**C.** centrioles  
**D.** mitochondrion  
**Answer:** D. mitochondrion  
The mitochondrion is the site of cellular respiration, producing energy in the form of ATP.

**15. One of the following causes Ebola fever**  
**A.** Bacteria  
**B.** Fungi  
**C.** Protozoa  
**D.** Viruses  
**Answer:** D. Viruses  
Ebola fever is caused by the Ebola virus.

**16. The theory of survival of the fittest was propounded by …..**  
**A.** Darwin  
**B.** Hooke  
**C.** Lamarck  
**D.** Linnaeus  
**Answer:** A. Darwin  
Darwin introduced the concept of survival of the fittest in his theory of natural selection.

**17. The deficiency of vitamin D leads to**  
**A.** beriberi  
**B.** pellagra  
**C.** ricket  
**D.** scurvy  
**Answer:** C. ricket  
Rickets is caused by a deficiency of vitamin D, leading to weak or soft bones.

**18. One of these is used for excretion in earthworm**  
**A.** Contractile vacuole  
**B.** Flame cell  
**C.** Malpighian tubule  
**D.** Nephridium  
**Answer:** D. Nephridium  
Nephridia are the excretory organs in earthworms.

**19. The following group of plants is the most advanced except**  
**A.** bryophyte  
**B.** pteridophyta  
**C.** spermatophyte  
**D.** thallophytic  
**Answer:** D. thallophytic  
Thallophytes are the least advanced as they lack true stems, roots, and leaves.

**20. Which of the following hormonal glands is located on top of the kidney?**  
**A.** Adrenal  
**B.** gonads  
**C.** pancreas  
**D.** thyroid  
**Answer:** A. Adrenal  
The adrenal glands sit on top of each kidney and produce hormones such as adrenaline and cortisol.

**221. One of these is present in both plant and animal cell?**  
**A.** Cell membrane  
**B.** Cell wall  
**C.** Chloroplast  
**D.** Large cell vacuole  
**Answer:** A. Cell membrane  
The cell membrane is present in both plant and animal cells, while the cell wall and chloroplasts are exclusive to plant cells.

**22. When the solute concentration of the cell and its surrounding medium are the same, the solution is said to be**  
**A.** hypertonic  
**B.** hypotonic  
**C.** isotonic  
**D.** acidic  
**Answer:** C. isotonic  
In an isotonic solution, there is no net movement of water as the solute concentration is the same inside and outside the cell.

**23. The primary consumer in the food chain below is ................**  
Green plants → Grasshopper → Lizard → Snake → Hawk  
**A.** Grasshopper  
**B.** Green plants  
**C.** Hawk  
**D.** Lizard  
**Answer:** A. Grasshopper  
Grasshoppers feed directly on green plants, making them primary consumers.

**24. Angiosperms belong to the class**  
**A.** bryophyte  
**B.** pteridophyta  
**C.** spermatophyte  
**D.** thallophytic  
**Answer:** C. spermatophyte  
Angiosperms are flowering plants and belong to the class Spermatophyta.

**25. In the kidney, both useful substances and wastes are removed from the blood by**  
**A.** Filtration  
**B.** Selective absorption  
**C.** Dialysis machine  
**D.** Excretion  
**Answer:** A. Filtration  
Filtration occurs in the glomeruli of the kidneys, removing both useful and waste substances from the blood.

**26. Which of the following is not part of the mammalian male reproductive organ?**  
**A.** Epididymis  
**B.** Vas deferens  
**C.** Testis  
**D.** Vulva  
**Answer:** D. Vulva  
The vulva is part of the female reproductive system, not the male.

**27. Which of the following reagent is used for testing the presence of protein in food?**  
**A.** Benedict solution  
**B.** Fehling’s Solution  
**C.** Millon’s reagent  
**D.** Sudan III  
**Answer:** C. Millon’s reagent  
Millon’s reagent is used to test for proteins, while Benedict’s and Fehling’s test for reducing sugars, and Sudan III tests for lipids.

**28. The breaking down of food in the alimentary canal is called**  
**A.** Digestion  
**B.** Egestion  
**C.** Excretion  
**D.** Ingestion  
**Answer:** A. Digestion  
Digestion is the process of breaking down food into smaller molecules for absorption.

**29. The followings are the functions of the kidneys, except**  
**A.** Regulation of water content in the blood  
**B.** Maintenance of blood pH and homeostasis  
**C.** Excretion of CO₂  
**D.** Removal of waste products from the blood  
**Answer:** C. Excretion of CO₂  
The kidneys do not excrete CO₂; this is primarily the function of the lungs.

**30. The following disrupt the balance in an ecosystem except**  
**A.** Afforestation  
**B.** Deforestation  
**C.** Migration  
**D.** Pollution  
**Answer:** A. Afforestation  
Afforestation (planting trees) helps restore balance in an ecosystem, unlike the other activities which disrupt it.

**31. The following animals are viviparous except**  
**A.** Cow  
**B.** Dog  
**C.** Goat  
**D.** Pigeon  
**Answer:** D. Pigeon  
Viviparous animals give birth to live young, while pigeons are oviparous (lay eggs).

**32. The following animals are invertebrates except**  
**A.** Flat worms  
**B.** Round worms  
**C.** Chordate  
**D.** Protozoan  
**Answer:** C. Chordate  
Chordates are vertebrates, unlike flatworms, roundworms, and protozoans, which are invertebrates.

**33. The following are kidney diseases except**  
**A.** Diuresis  
**B.** Hepatitis  
**C.** Nephritis  
**D.** Oedema  
**Answer:** B. Hepatitis  
Hepatitis is a liver disease, not a kidney disease.

**34. The gland that releases hormones into the blood are part of the**  
**A.** Digestive system  
**B.** Endocrine system  
**C.** Circulatory system  
**D.** Respiratory system  
**Answer:** B. Endocrine system  
The endocrine system consists of glands that secrete hormones directly into the bloodstream.

**35. One of the following is called an emergency hormone in man.**  
**A.** Adrenalin  
**B.** Prolactin  
**C.** Testosterone  
**D.** Thyroxine  
**Answer:** A. Adrenalin  
Adrenalin is released during emergencies to prepare the body for a "fight or flight" response.

**36. Which of these responses is not voluntarily controlled by the brain?**  
**A.** Dancing  
**B.** Eating  
**C.** Sneezing  
**D.** Writing  
**Answer:** C. Sneezing  
Sneezing is a reflex action and not under voluntary control.

**37. The scientific study of life is**  
**A.** Botany  
**B.** Biology  
**C.** Zoology  
**D.** Ecology  
**Answer:** B. Biology  
Biology is the scientific study of life and living organisms.

**38. The artery supplying the liver with blood is called**  
**A.** Hepatic  
**B.** Mesenteric  
**C.** Renal  
**D.** Subclavian  
**Answer:** A. Hepatic  
The hepatic artery supplies oxygenated blood to the liver.

**39. One of the following exists as a colony**  
**A.** Euglena  
**B.** Paramecium  
**C.** Spirogyra  
**D.** Volvox  
**Answer:** D. Volvox  
Volvox is a colonial organism made up of many individual cells functioning together.

**40. The translucency spot in a food test shows the presence of**  
**A.** Fats  
**B.** Starch  
**C.** Water  
**D.** Protein  
**Answer:** A. Fats  
A translucent spot indicates the presence of fats or oils in a food sample.

**41. The following are examples of oviparous animals except**  
**A.** Crocodile  
**B.** Dove  
**C.** Rat  
**D.** Tilapia  
**Answer:** C. Rat  
Rats are viviparous, meaning they give birth to live young, unlike the others that lay eggs.

**42. The part of the cell that is responsible for the production of energy is**  
**A.** Cell membrane  
**B.** Cytoplasm  
**C.** Mitochondrion  
**D.** Nucleus  
**Answer:** C. Mitochondrion  
The mitochondrion is known as the "powerhouse of the cell," where energy is produced through cellular respiration.

**43. Hormones that help regulate blood calcium levels are produced by the**  
**A.** Adrenal  
**B.** Thyroid  
**C.** Pancreas  
**D.** Parathyroid  
**Answer:** D. Parathyroid  
The parathyroid glands produce parathyroid hormone (PTH), which regulates blood calcium levels.

**44. Which of the following statements is not true of a fish?**  
**A.** Respires with the use of gills  
**B.** Covered with scales  
**C.** They are homeothermic  
**D.** They are poikilothermic  
**Answer:** C. They are homeothermic  
Fish are poikilothermic, meaning their body temperature varies with the environment.

**45. Which of the following is NOT a waste product of plants?**  
**A.** Auxins  
**B.** Gum  
**C.** Resins  
**D.** Tannins  
**Answer:** A. Auxins  
Auxins are plant hormones involved in growth, not waste products.

**46. An association between bacteria and root nodules of legume is called**  
**A.** Commensalism  
**B.** Mutualism  
**C.** Parasitism  
**D.** Saprophytism  
**Answer:** B. Mutualism  
This relationship benefits both the bacteria (which get nutrients) and the plant (which receives nitrogen).

**47. Which of these is not detected by the nerve endings of the skin?**  
**A.** Cold  
**B.** Pain  
**C.** Pressure  
**D.** Weakness  
**Answer:** D. Weakness  
Weakness is not a sensation detected by nerve endings in the skin.

**48. Behaviour conditioning was described by**  
**A.** Felix Dujardin  
**B.** Gregor Mendel  
**C.** Ivan Pavlov  
**D.** Matthias Schleiden  
**Answer:** C. Ivan Pavlov  
Ivan Pavlov described classical conditioning through his experiments with dogs.

**49. The process by which organisms keep their internal condition relatively stable is called**  
**A.** Metabolism  
**B.** Evolution  
**C.** Gametogenesis  
**D.** Homeostasis  
**Answer:** D. Homeostasis  
Homeostasis refers to maintaining a stable internal environment.

**50. The following exist as free-living organisms except**  
**A.** Amoeba  
**B.** Chlamydomonas  
**C.** Euglena  
**D.** Spirogyra  
**Answer:** C. Euglena  
Euglena can exist as a parasite or in symbiotic relationships, unlike the others, which are exclusively free-living.

**51. The basic functional unit of the kidney is the**  
**A.** Nephron  
**B.** Bowman’s capsule  
**C.** Glomerulus  
**D.** Loop of Henle  
**Answer:** A. Nephron  
The nephron is the basic functional unit of the kidney, responsible for filtration, reabsorption, and secretion.

**52. Snails belong to the phylum?**  
**A.** Annelida  
**B.** Mollusca  
**C.** Echinodermata  
**D.** Nematode  
**Answer:** B. Mollusca  
Snails are mollusks, a group that includes animals with soft bodies, often protected by a shell.

**53. Which of the following is not a pest of crops?**  
**A.** Bird  
**B.** Rodent  
**C.** Bed bug  
**D.** Grasshopper  
**Answer:** C. Bed bug  
Bed bugs are not crop pests; they are parasitic insects that feed on human blood.

**54. Another name for a fertilized egg is a**  
**A.** Placenta  
**B.** Zygote  
**C.** Foetus  
**D.** Ovum  
**Answer:** B. Zygote  
A fertilized egg is called a zygote, which forms after the sperm fertilizes the egg.

**55. Plants that survive in marine habitats are called**  
**A.** Halophytes  
**B.** Hydrophytes  
**C.** Mesophytes  
**D.** Xerophytes  
**Answer:** A. Halophytes  
Halophytes are plants that can thrive in salty, marine environments.

**56. The study of plants is called**  
**A.** Zoology  
**B.** Entomology  
**C.** Parasitology  
**D.** Botany  
**Answer:** D. Botany  
Botany is the branch of biology that deals with the study of plants.

**57. The following are examples of air-borne diseases, except**  
**A.** Chicken pox  
**B.** Cholera  
**C.** Common cold  
**D.** Whooping cough  
**Answer:** B. Cholera  
Cholera is a waterborne disease, not airborne.

**58. Which of the following is the end product of the digestion of oil**  
**A.** Glucose  
**B.** Glycerol  
**C.** Amino acid  
**D.** Glycogen  
**Answer:** B. Glycerol  
The digestion of fats (oils) results in the production of glycerol and fatty acids.

**59. The part that supplies food from the mother to the foetus is**  
**A.** Amnion  
**B.** Chorion  
**C.** Umbilical Cord  
**D.** Placenta  
**Answer:** D. Placenta  
The placenta supplies food and oxygen from the mother to the foetus.

**60. Which of these is not part of the eye?**  
**A.** Cochlea  
**B.** Conjunctiva  
**C.** Cornea  
**D.** Iris  
**Answer:** A. Cochlea  
The cochlea is part of the ear, not the eye.

**61. De-oxygenated blood is transported to the lungs through the**  
**A.** Renal vein  
**B.** Hepatic portal vein  
**C.** Pulmonary artery  
**D.** Pulmonary vein  
**Answer:** C. Pulmonary artery  
The pulmonary artery carries de-oxygenated blood from the heart to the lungs for oxygenation.

**62. One of the following is the unit of life**  
**A.** Cell  
**B.** Tissues  
**C.** Organ  
**D.** System  
**Answer:** A. Cell  
The cell is the basic unit of life, responsible for all biological functions.

**63. The following are examples of a true fruit, except**  
**A.** Mango  
**B.** Oil palm  
**C.** Orange  
**D.** Pineapple  
**Answer:** D. Pineapple  
Pineapple is not a true fruit but a composite fruit formed from multiple flowers.

**64. The vector that transmits trypanosome is the**  
**A.** Butterfly  
**B.** Housefly  
**C.** Mosquito  
**D.** Tsetse fly  
**Answer:** D. Tsetse fly  
The tsetse fly is the vector responsible for transmitting trypanosomes, which cause sleeping sickness.

**65. The following are ductless glands except**  
**A.** Adrenal  
**B.** Pancreatic  
**C.** Parathyroid  
**D.** Salivary  
**Answer:** D. Salivary  
Salivary glands are exocrine glands, not ductless, as they secrete saliva through ducts.

**66. White blood cells are also known as**  
**A.** Erythrocytes  
**B.** Leucocytes  
**C.** Lymphocytes  
**D.** Phagocytes  
**Answer:** B. Leucocytes  
White blood cells are also called leucocytes and are involved in defending the body against infections.

**67. The removal of remnant particles of digestion from the body is called**  
**A.** Assimilation  
**B.** Egestion  
**C.** Elimination  
**D.** Excretion  
**Answer:** B. Egestion  
Egestion refers to the removal of indigestible food particles from the body.

**68. Enzyme ptyalin acts on starch in the**  
**A.** Oesophagus  
**B.** Large intestine  
**C.** Mouth  
**D.** Stomach  
**Answer:** C. Mouth  
Ptyalin, also known as salivary amylase, is an enzyme found in the mouth that breaks down starch into simpler sugars.

**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2016**

**1. Which of the following conditions is NOT necessary for photosynthesis to take place?**  
**A.** Chlorophyll  
**B.** Light  
**C.** Carbon(II)oxide  
**D.** Carbon(IV)oxide  
**Answer:** D. Carbon(IV)oxide  
Photosynthesis requires carbon dioxide (CO₂), not carbon(IV)oxide. It uses carbon dioxide, light, and chlorophyll to produce glucose and oxygen.

**2. The insects in which the maxillae are modified into a long coiled proboscis is**  
**A.** Housefly  
**B.** Butterfly  
**C.** Mosquito  
**D.** Grasshopper  
**Answer:** B. Butterfly  
In butterflies, the maxillae are modified into a long coiled proboscis used for feeding on nectar.

**3. When a cell is placed in solution and the size of the cell increases, the concentration of solution is said to be**  
**A.** Isotonic  
**B.** Dilute  
**C.** Hypotonic  
**D.** Hypertonic  
**Answer:** C. Hypotonic  
In a hypotonic solution, the concentration of solute outside the cell is lower, causing water to enter the cell, resulting in an increase in cell size.

**4. Which of the following plant hormones is responsible for the ripening of fruits?**  
**A.** Gibberellins  
**B.** Abscisic acid  
**C.** Ethylene  
**D.** Cytokinins  
**Answer:** C. Ethylene  
Ethylene is a plant hormone that regulates the ripening of fruits.

**5. The ability of a living organism to detect and respond to changes in the environment is referred to as**  
**A.** Locomotion  
**B.** Taxis  
**C.** Irritability  
**D.** Growth  
**Answer:** C. Irritability  
Irritability is the ability of an organism to respond to environmental stimuli.

**6. An example of an endospermous seed is**  
**A.** Bean seed  
**B.** Cashew nut  
**C.** Cotton seed  
**D.** Maize grain  
**Answer:** D. Maize grain  
Endospermous seeds contain endosperm, a tissue that provides nourishment to the developing embryo, and maize is an example of such a seed.

**7. Which of the following theories was NOT considered by Darwin in his evolutionary theory?**  
**A.** Variation  
**B.** Survival of the fittest  
**C.** Use and disuse  
**D.** Competition  
**Answer:** C. Use and disuse  
The theory of "use and disuse" was proposed by Lamarck, not Darwin. Darwin's theory included variation, survival of the fittest, and competition.

**8. Which of the following protects the essential parts of the flower at the bud stage?**  
**A.** Stamens  
**B.** Sepals  
**C.** Petals  
**D.** Carpels  
**Answer:** B. Sepals  
Sepals protect the flower's reproductive organs when the flower is in bud form.

**9. Which of the following is an agent of a sexually transmitted disease?**  
**A.** Entamoeba histolytica  
**B.** Salmonella typhi  
**C.** Treponema pallidum  
**D.** Clostridium tetani  
**Answer:** C. Treponema pallidum  
Treponema pallidum is the bacterium that causes syphilis, a sexually transmitted disease.

**10. Which of the following animals has homodont dentition?**  
**A.** Rat  
**B.** Man  
**C.** Lizard  
**D.** Pigeon  
**Answer:** D. Pigeon  
Homodont dentition refers to having teeth of the same type or shape, and pigeons have this type of dentition.

**11. The movement of blood between the heart and all other parts of the body besides the lung is known as**  
**A.** Systemic circulation  
**B.** Closed circulatory system  
**C.** Pulmonary circulation  
**D.** Single circulation system  
**Answer:** A. Systemic circulation  
Systemic circulation is the movement of blood from the heart to the rest of the body (excluding the lungs) and back.

**12. If the cross of a red-flowered plant with a white-flowered plant produces a pink-flowered plant, this is an example of**  
**A.** Codominance  
**B.** Incomplete dominance  
**C.** Mutation  
**D.** Linkage  
**Answer:** B. Incomplete dominance  
Incomplete dominance occurs when the offspring has a phenotype that is a blend of the parental traits, as seen with the pink flowers from red and white parents.

**13. The largest amount of yolk is found in the egg of**  
**A.** Amphibians  
**B.** Pisces  
**C.** Reptiles  
**D.** Aves  
**Answer:** D. Aves  
Birds (aves) typically have eggs with the largest amount of yolk compared to amphibians, fish, or reptiles.

**14. Fibrinogen and prothrombin play important roles in the**  
**A.** Deamination of proteins  
**B.** Clotting of blood  
**C.** Detoxification of substances  
**D.** Storage of vitamins  
**Answer:** B. Clotting of blood  
Fibrinogen and prothrombin are proteins that play a crucial role in the blood clotting process.

**15. The pathogen that causes smallpox is**  
**A.** Picornavirus  
**B.** Peramyxovirus  
**C.** Herpesvirus  
**D.** Poxvirus  
**Answer:** D. Poxvirus  
Smallpox is caused by the variola virus, which is a member of the poxvirus family.

**16. The vector for the malaria parasite is a**  
**A.** Female Aedes mosquito  
**B.** Female Anopheles mosquito  
**C.** Female Culex mosquito  
**D.** Female Culex mosquito  
**Answer:** B. Female Anopheles mosquito  
The malaria parasite is transmitted by the female Anopheles mosquito.

**17. Which of the following pairs are social insects?**  
**A.** Termite and locust  
**B.** Ants and cockroach  
**C.** Cockroach and bee  
**D.** Termite and bee  
**Answer:** D. Termite and bee  
Both termites and bees are social insects that live in structured colonies.

**18. Which of the following is NOT a method of conserving wildlife?**  
**A.** Indiscriminate poaching  
**B.** Establishment of zoological gardens  
**C.** Enacting wildlife conservation laws  
**D.** Establishment of game reserves  
**Answer:** A. Indiscriminate poaching  
Poaching is harmful to wildlife conservation efforts, as it leads to the decline in animal populations.

**19. The importance of the mouth-brooding behaviour in Tilapia is that it**  
**A.** Helps in keeping the young fish warm  
**B.** Affords protection from predation for the young fish  
**C.** Helps the fish to live in a social group  
**D.** Provides regurgitated nourishment to the young fish  
**Answer:** B. Affords protection from predation for the young fish  
Mouth-brooding in Tilapia provides protection for the young fish from predators.

**20. The type of asexual reproduction that is common to both Paramecium and Protists is**  
**A.** Fragmentation  
**B.** Budding  
**C.** Sporulation  
**D.** Fission  
**Answer:** D. Fission  
Paramecium and many protists reproduce asexually by binary fission, where the cell divides into two.

**21. The micro-organisms that cause Typhoid disease is**  
**A.** Trypanosoma gambiense  
**B.** Salmonella typhi  
**C.** Entamoeba histolytica  
**D.** Plasmodium sp  
**Answer:** B. Salmonella typhi  
Salmonella typhi is the bacterium responsible for causing typhoid fever.

**22. A collection of population of all living organisms that exist in a habitat is referred to as**  
**A.** Niche  
**B.** Ecosystem  
**C.** Community  
**D.** Environment  
**Answer:** C. Community  
A community is a collection of populations of different species living together in a habitat.

**23. The theory of use and disuse of organs was promulgated by**  
**A.** Alfred Wallace  
**B.** Charles Darwin  
**C.** Jean Lamarck  
**D.** Robert Hook  
**Answer:** C. Jean Lamarck  
Jean Lamarck proposed the theory of use and disuse, which suggests that organs not used would deteriorate, and those that were used more would become stronger.

**24. The theory of natural selection was postulated by**  
**A.** Gregor Mendel  
**B.** Matthias Schleiden  
**C.** Charles Darwin  
**D.** Robert Hook  
**Answer:** C. Charles Darwin  
Charles Darwin formulated the theory of natural selection, which explains how species evolve over time based on survival and reproduction.

**25. The movement response of a cockroach away from a light source is**  
**A.** Negative phototaxism  
**B.** Positive phototaxism  
**C.** Negative phototropism  
**D.** Positive phototropism  
**Answer:** A. Negative phototaxism  
Negative phototaxism is when an organism moves away from a light source, as seen in cockroaches.

**26. Which of the following can cause shrinkage of living cells?**  
**A.** Deionized water  
**B.** Hypotonic solution  
**C.** Isotonic solution  
**D.** Hypertonic solution  
**Answer:** D. Hypertonic solution  
In a hypertonic solution, the concentration of solutes outside the cell is higher, causing water to leave the cell and leading to shrinkage.

**27. The ability of a chameleon to change its colour rapidly is an adaptation for**  
**A.** Obtaining food  
**B.** Attraction mate  
**C.** Communication  
**D.** Escaping detection  
**Answer:** D. Escaping detection  
The chameleon’s ability to change color helps it blend into its environment, aiding in camouflage to avoid predators.

**28. The function of the red head in male Agama lizards is to**  
**A.** Scare other males from the territory  
**B.** Warn predators of the distastefulness of the animal  
**C.** Attract female lizards for mating purposes  
**D.** Conceal and camouflage the animal from predators  
**Answer:** C. Attract female lizards for mating purposes  
The red head is a characteristic that signals to female lizards that the male is a potential mate.

**29. The activity of ptyalin is likely to decrease with an increase in the concentration of**  
**A.** Oxygen  
**B.** Starch  
**C.** Protein  
**D.** Acid  
**Answer:** D. Acid  
Ptyalin is an enzyme that breaks down starch. The presence of acid, such as in the stomach, can denature enzymes like ptyalin, decreasing its activity.

**30. Seed plants are divided into**  
**A.** Monocotyledons and dicotyledons  
**B.** Tracheophytes and ferns  
**C.** Angiosperms and gymnosperms  
**D.** Thallophytes and bryophytes  
**Answer:** C. Angiosperms and gymnosperms  
Seed plants are classified into angiosperms (flowering plants) and gymnosperms (non-flowering plants).

**31. The adaptive importance of the nuptial flight from termite colonies is to**  
**A.** Ensure cross-breeding between members of one colony and another  
**B.** Disperse the reproductives in order to establish new colonies  
**C.** Provide abundant food for birds and other animals during the early rains  
**D.** Expel the reproductives so as to provide enough food for other members  
**Answer:** B. Disperse the reproductives in order to establish new colonies  
The nuptial flight allows the reproductive termites (kings and queens) to leave their colony and establish new colonies elsewhere.

**32. The sequence of the one-way gaseous exchange mechanism in a fish is**  
**A.** Gills ⇢ Operculum ⇢ Mouth  
**B.** Mouth ⇢ Gills ⇢ Operculum  
**C.** Mouth ⇢ Operculum ⇢ Gills  
**D.** Operculum ⇢ Mouth ⇢ Gills  
**Answer:** B. Mouth ⇢ Gills ⇢ Operculum  
Water enters through the mouth, passes over the gills where gas exchange occurs, and exits through the operculum.

**33. In the nitrogen cycle, the nitrates in the soil are converted to atmospheric nitrogen by**  
**A.** Putrefying bacteria  
**B.** Nitrogen-fixing bacteria  
**C.** Nitrifying bacteria  
**D.** Denitrifying bacteria  
**Answer:** D. Denitrifying bacteria  
Denitrifying bacteria convert nitrates in the soil back into atmospheric nitrogen.

**34. The relationship between a termite and the protozoan in its intestine is described as**  
**A.** Predation  
**B.** Saprophytism  
**C.** Symbiosis  
**D.** Parasitism  
**Answer:** C. Symbiosis  
Termites and the protozoans in their intestines have a mutualistic relationship, as the protozoans help break down cellulose in the termite’s food, and the termites provide the protozoans with a habitat and food.

**35. Exo-erythrocytic phase of the life cycle of malaria parasite occurs in the**  
**A.** Liver of humans  
**B.** Reticuloendothelial cells of humans  
**C.** Malphigian tubules of mosquito  
**D.** Brain of humans  
**Answer:** A. Liver of humans  
The exo-erythrocytic phase of the malaria parasite occurs in the liver of humans, where the parasite undergoes its first stage of development before entering the red blood cells.

**36. Which of the following organs regulates the levels of water, salts, hydrogen ions, and urea in mammals?**  
**A.** Kidney  
**B.** Colon  
**C.** Bladder  
**D.** Liver  
**Answer:** A. Kidney  
The kidneys regulate water, salts, hydrogen ions, and urea in mammals through processes like filtration, reabsorption, and secretion.

**37. The rate of transpiration is NOT affected by**  
**A.** The weight of the stomata pores  
**B.** Humidity  
**C.** Temperature  
**D.** The size of the stomata pores  
**Answer:** A. The weight of the stomata pores  
Transpiration rate is affected by humidity, temperature, and the size of the stomata, but not by the weight of the stomata pores.

**38. The crossing of individuals of the same species with different genetic characters is**  
**A.** Cross breeding  
**B.** Polygenic inheritance  
**C.** Non-disjunction  
**D.** Inbreeding  
**Answer:** A. Cross breeding  
Cross breeding involves mating individuals with different genetic traits to produce offspring with a combination of those traits.

**39. The hereditary characters in plants and animals are located on the**  
**A.** Gene  
**B.** Nucleus  
**C.** Chromosome  
**D.** Cell  
**Answer:** C. Chromosome  
Hereditary information is carried on chromosomes, which are located in the nucleus of the cell.

**40. The arrangement of ovules attached to the sides of a syncarpous ovary with a single chamber is referred to as**  
**A.** Free-central placentation  
**B.** Axile placentation  
**C.** Parietal placentation  
**D.** Marginal placentation  
**Answer:** C. Parietal placentation  
Parietal placentation occurs when the ovules are attached to the sides of a syncarpous ovary with a single chamber.

**41. When a sickle cell carrier marries a normal woman, the probability of them having a normal offspring is**  
**A.** 0.75  
**B.** 0.25  
**C.** 0.5  
**D.** 0.1  
**Answer:** A. 0.75  
If a sickle cell carrier (heterozygous) marries a normal woman (homozygous normal), the probability of them having a normal offspring is 75%. The genotypes would be Ss (carrier) x SS (normal), and the offspring will have a 75% chance of being normal (SS or Ss).

**42. In which of the following groups of vertebrates is parental care mostly exhibited?**  
**A.** Aves  
**B.** Reptilia  
**C.** Amphibia  
**D.** Mammalia  
**Answer:** A. Aves  
Parental care is most commonly exhibited in birds (Aves), where both parents often care for the offspring.

**43. An example of a non-biodegradable pollutant is**  
**A.** Dung  
**B.** Bones  
**C.** Ceramics  
**D.** Woods  
**Answer:** C. Ceramics  
Ceramics are non-biodegradable pollutants because they do not break down naturally in the environment.

**44. The bacteria that is found in the root nodules of leguminous plants is**  
**A.** Clostridium  
**B.** Rhizobium  
**C.** Nostoc  
**D.** Azotobacter  
**Answer:** B. Rhizobium  
Rhizobium bacteria are responsible for fixing nitrogen in the root nodules of leguminous plants.

**45. Which of these organisms partly digest its food extracellularly?**  
**A.** Butterfly  
**B.** Cockroach  
**C.** Spider  
**D.** Mosquito  
**Answer:** B. Cockroach  
Cockroaches partly digest their food extracellularly in the stomach before absorbing it in the intestines.

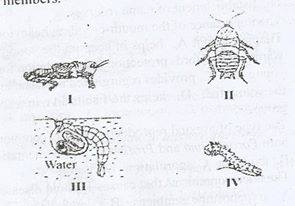
**46. Strong short and conical beak to pick and crush seeds is an adaptive feature of**  
**A.** Duck  
**B.** Owl  
**C.** Weaver bird  
**D.** Hawk  
**Answer:** C. Weaver bird  
Weaver birds have strong, short, and conical beaks that help them pick and crush seeds efficiently.

**47. The path followed by air as it passes through the lungs in mammals is**  
**A.** Bronchi ⇢ Trachea ⇢ Alveoli ⇢ Bronchioles  
**B.** Bronchioles ⇢ Alveoli ⇢ Bronchi ⇢ Trachea  
**C.** Trachea ⇢ Bronchi ⇢ Bronchioles ⇢ Alveoli  
**D.** Trachea ⇢ Bronchioles ⇢ Bronchi ⇢ Alveoli  
**Answer:** C. Trachea ⇢ Bronchi ⇢ Bronchioles ⇢ Alveoli  
Air travels from the trachea to the bronchi, then to the bronchioles, and finally to the alveoli for gas exchange.

**48. In which of the following species is the biomass of an individual the smallest?**  
**A.** Tilapia sp  
**B.** Agama sp  
**C.** Bufo sp  
**D.** Spirogyra sp  
**Answer:** D. Spirogyra sp  
Spirogyra, a type of algae, has the smallest biomass of the listed species.

**49. The part of the mammalian ear responsible for the maintenance of balance is the**  
**A.** Cochlea  
**B.** Pinna  
**C.** Perilymph  
**D.** Vestibular system  
**Answer:** D. Vestibular system  
The vestibular system, located in the inner ear, is responsible for maintaining balance.

**50.**



Which of the organisms represented are notable agricultural pests?

**A.** II and IV

**B.** I and IV

**C.** I and III

**D.** II and III

From the given diagram:

**I**: A grasshopper, which is a well-known agricultural pest.

**II**: An aphid, another significant agricultural pest known for damaging crops by sucking plant sap.

**III**: A mosquito larva, which is not an agricultural pest but rather a vector of diseases.

**IV**: A caterpillar, also a notorious agricultural pest that feeds on leaves and crops.

The correct answer is:

**A. II and IV**

**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2017**

**1. The matured sex cell which takes part in sexual reproduction is referred to as**  
**A.** Gamete  
**B.** Fetus  
**C.** Embryo  
**D.** Zygote  
**Answer:** A. Gamete  
The mature sex cells, sperm in males and eggs in females, are called gametes and participate in sexual reproduction.

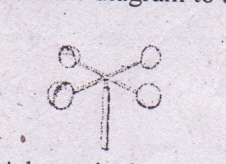
**2. The biome that is characterized with large herbivores, few and scattered fire-resistant trees is**  
**A.** Savanna  
**B.** Tropical rain forest  
**C.** Montane forest  
**D.** Desert  
**Answer:** A. Savanna  
The savanna biome is characterized by large herbivores and scattered fire-resistant trees.

**3. Red blood cells are also known as \_\_\_\_\_\_\_\_\_?**  
**A.** Erythrocytes  
**B.** Thrombocytes  
**C.** Phagocytes  
**D.** Leucocytes  
**Answer:** A. Erythrocytes  
Red blood cells are called erythrocytes.

**4. The joint between the femur and tibia is known as \_\_\_\_\_\_\_\_?**  
**A.** Hinge joint  
**B.** Ball-and-socket joint  
**C.** Pivot joint  
**D.** Gliding joint  
**Answer:** A. Hinge joint  
The femur and tibia are connected by a hinge joint, which allows movement in one plane.

**5. What is the primary function of cofactors?**  
**A.** To aid in enzyme function  
**B.** To synthesize enzymes  
**C.** To inhibit enzymes  
**D.** To break down old enzymes  
**Answer:** A. To aid in enzyme function  
Cofactors are non-protein molecules that assist enzymes in their biochemical functions.

**6.**



**Use the diagram below to answer the question that follow:  
The diagram represents a**

A. hygrometer

B. Wind vane

C. Anemometer

D. rain gauge

**Answer:** The diagram represents an anemometer, a device used to measure wind speed.

The correct answer is:  
C. Anemometer

**7. Coloration of the eye is \_\_\_\_\_\_ variation**  
**A.** Physiological  
**B.** Morphological  
**C.** Adaptive  
**D.** Recessive  
**Answer:** B. Morphological  
Coloration of the eye is a morphological variation, as it involves the physical characteristics of the eye.

**8. Which of the following choices correctly describes the composition of the cell membrane?**  
**A.** Contains only lipids  
**B.** Contains lipids and protein  
**C.** Contains lipids and cytosol  
**D.** Contains only proteins  
**Answer:** B. Contains lipids and protein  
The cell membrane is composed of a lipid bilayer with embedded proteins.

**9. The feeding relationship among a set of members of a community is referred to as \_\_\_\_\_\_\_?**  
**A.** A food web  
**B.** Pyramid of energy  
**C.** A food chain  
**D.** Pyramid of number  
**Answer:** A. A food web  
A food web illustrates the complex feeding relationships within a community.

**10. Nitrogen is released into the atmosphere when \_\_\_\_\_\_\_\_**  
**A.** Plants absorb mineral salts  
**B.** Sugar is completely broken down  
**C.** Through plant uptake  
**D.** When lightning strikes  
**Answer:** D. When lightning strikes  
Lightning can convert nitrogen in the atmosphere into nitrogen compounds, releasing nitrogen into the environment.

**11. Size, colour, and fingerprints are examples of \_\_\_\_\_\_**  
**A.** Physiological variation  
**B.** Discontinuous variation  
**C.** Morphological variation  
**D.** Adaptive variation  
**Answer:** C. Morphological variation  
Size, color, and fingerprints are all physical characteristics, making them examples of morphological variation.

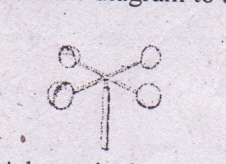
**12. The level of organization in Spirogyra and Volvox is**  
**A.** Organ  
**B.** System  
**C.** Cell  
**D.** Tissue  
**Answer:** C. Cell  
Both Spirogyra and Volvox are unicellular organisms, so their level of organization is cellular.

**13. Which of the following scenarios is an example of cohesion?**  
**A.** Water molecules stick to the surface of a mirror.  
**B.** Water sticks to the walls of blood vessels.  
**C.** Water molecules stay on the tip of a pine needle because the water is attracted to the surface of the needle.  
**D.** Water molecules stick to one another and form a bead  
**Answer:** D. Water molecules stick to one another and form a bead  
Cohesion refers to the attraction between water molecules, which causes them to stick to each other.

**14. The common thing in plant and animal cells is**  
**A.** Chloroplast  
**B.** Cell wall  
**C.** Nucleus  
**D.** Centrioles  
**Answer:** C. Nucleus  
Both plant and animal cells have a nucleus.

**15. The modification in structure, physiology, and behavior of plants and animals is called \_\_\_\_\_\_**  
**A.** Adaptation  
**B.** Evolution  
**C.** Variation  
**D.** Succession  
**Answer:** A. Adaptation  
Adaptation refers to the changes that occur in structure, physiology, and behavior to help organisms survive in their environment.

**16.**



**The instrument is used to measure**

**A.** atmospheric pressure

**B.** relative humidity

**C.** direction of wind

**D.** speed of wind

**Answer:** The correct answer is:

**D. speed of wind**

An **anemometer** is an instrument specifically designed to measure the speed of wind.

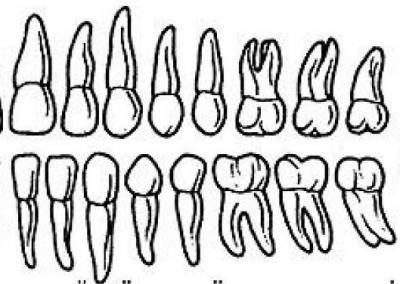
**17. A bacteria that is spherically shaped is called?**  
**A.** Diplobacillus  
**B.** Coccus  
**C.** Bacillus  
**D.** Vibrio  
**Answer:** B. Coccus  
Coccus refers to bacteria that are spherical in shape.

**18. The flame cells are used for excretion in**  
**A.** Fluke  
**B.** Nematode  
**C.** Bacteria  
**D.** Volvox  
**Answer:** A. Fluke  
Flame cells are used for excretion in certain invertebrates like flatworms (flukes).

**19. Food chain refers to the feeding relationships between animals in a \_\_\_\_\_\_?**  
**A.** Family  
**B.** Phylum  
**C.** Community  
**D.** Group  
**Answer:** C. Community  
A food chain describes the feeding relationships between organisms in a community.

**20. The host of Taenia Solium is \_\_\_\_\_\_\_\_\_**  
**A.** Cow  
**B.** Pig  
**C.** Sheep  
**D.** Dog  
**Answer:** B. Pig  
The intermediate host of Taenia solium (pork tapeworm) is the pig.

**21.**



**Use the diagram to answer the question that follows.**  
  
The dentition is found in

**A.** rat

**B.** dog

**C.** sheep

**D.** man

The diagram shows **human dentition**, characterized by the presence of incisors, canines, premolars, and molars in a dental formula typical of humans.

The correct answer is:  
**D. man**

**22. When an ovary is placed on the receptacle above the other floral parts it is referred to as**  
**A.** Half inferior ovary  
**B.** Superior ovary  
**C.** Inferior ovary  
**D.** Half superior ovary  
**Answer:** B. Superior ovary  
In a superior ovary, the ovary is placed above the other floral parts.

**23. The type of nutrition exhibited when an organism lives on the body surface or inside the body of another type of organism is**  
**A.** Holozoic  
**B.** Parasitic  
**C.** Saprohytic  
**D.** Carnivores  
**Answer:** B. Parasitic  
Parasitic nutrition involves organisms living on or inside another organism and benefiting at the host's expense.

**24. An example of organism which exists as a colony is**  
**A.** Volvox  
**B.** Paramecium  
**C.** Euglena  
**D.** Chlamydomonas  
**Answer:** A. Volvox  
Volvox is a colonial organism where individual cells form a colony.

**25. The following are examples of morphological variation except**  
**A.** Size  
**B.** Ability to taste PTC  
**C.** Color  
**D.** Fingerprint  
**Answer:** B. Ability to taste PTC  
The ability to taste PTC is a physiological trait, not morphological.

**26. Ability to taste PTC in some individuals is a character that is**  
**A.** Acquired  
**B.** Heritable  
**C.** Sex-linked  
**D.** Morphological  
**Answer:** B. Heritable  
The ability to taste PTC is determined by genetic inheritance.

**27. Agglutination is the \_\_\_\_\_\_\_ of the \_\_\_\_\_\_\_\_**  
**A.** Coagulation, white blood cell  
**B.** Coagulation, water  
**C.** White blood cells, red blood cells  
**D.** Coagulation, red blood cell  
**Answer:** C. White blood cells, red blood cells  
Agglutination is the clumping of red blood cells due to an immune response, often involving white blood cells.

**28. What organelle is the site of photosynthesis in plants?**  
**A.** Chloroplasts  
**B.** Ribosomes  
**C.** Cytoplasm  
**D.** Mitochondria  
**Answer:** A. Chloroplasts  
Chloroplasts are the organelles in plant cells where photosynthesis occurs.

**29. Which of the following is a characteristic of a bacteria except \_\_\_\_\_\_\_?**  
**A.** They can be seen under microscope  
**B.** They range from 0.5 µm in diameter  
**C.** They are grouped according to their cell shape  
**D.** They do not cause disease  
**Answer:** D. They do not cause disease  
While some bacteria are harmless, others cause disease.

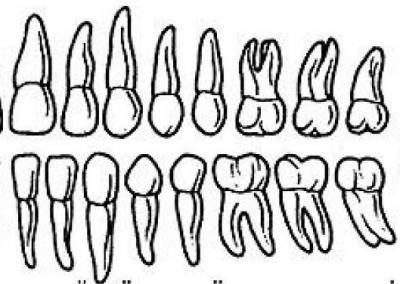
**30. The level of organization of Amoeba and Euglena cell is \_\_\_\_\_\_\_?**  
**A.** Organ  
**B.** System  
**C.** Cell  
**D.** Tissue  
**Answer:** C. Cell  
Amoeba and Euglena are unicellular organisms, so their level of organization is at the cellular level.

**31. The appendicular skeleton includes**  
**A.** Pectoral and pelvic girdles  
**B.** Forelimbs, skull, and pectoral girdle  
**C.** Lungs and ribs  
**D.** Skull and the vertebral column  
**Answer:** A. Pectoral and pelvic girdles  
The appendicular skeleton consists of the limbs and the girdles (pectoral and pelvic) that attach them to the axial skeleton.

**32. The protista that is a producer in an aquatic food chain is**  
**A.** Trypanosome  
**B.** Paramecium  
**C.** Chlamydomonas  
**D.** Amoeba  
**Answer:** C. Chlamydomonas  
Chlamydomonas is a photosynthetic protist that acts as a producer in aquatic food chains.

**33. The difference in structure, morphological, and behavior of plant and animal is called**  
**A.** Adaptation  
**B.** Evolution  
**C.** Variation  
**D.** Succession  
**Answer:** A. Adaptation  
Adaptation refers to the structural, morphological, and behavioral changes that allow organisms to survive and reproduce in their environments.

**34.**



**Use the diagram to answer the question that follows**  
  
The structure is adapted for

**A.** omnivores

**B.** herbivores

**C.** canivores

**D.** omnivores and canivore

**Answer:** The correct answer is:

**A. omnivores**

Explanation:  
Human dentition is adapted for an omnivorous diet. It includes:

**Incisors** for cutting.

**Canines** for tearing.

**Premolars and molars** for grinding and chewing.

This variety of teeth reflects the ability to consume both plant and animal-based foods.

**35. The product after the union of the male and female gamete in animals is called**  
**A.** Sperm  
**B.** Egg  
**C.** Embryo  
**D.** Zygote  
**Answer:** D. Zygote  
The zygote is the fertilized egg that results from the union of the male and female gametes.

**36. The possession of scales, laying of eggs with shells, and bony structure of the head are characteristics shared by**  
**A.** Birds and reptiles  
**B.** Fishes and birds  
**C.** Reptiles and fishes  
**D.** Birds and molluscs  
**Answer:** A. Birds and reptiles  
Both birds and reptiles share these characteristics.

**37. The lungs of the lungfish are an adaptation for respiration \_\_\_\_\_\_\_?**  
**A.** To complement gills while in water  
**B.** To complement gills while on land  
**C.** While on land  
**D.** While in water  
**Answer:** C. While on land  
Lungfish have lungs that allow them to breathe air when they are on land or in oxygen-poor water.

**38. Which of the following is an example of active transport?**  
**A.** Oxygen exchanging between red blood cells and liver cells  
**B.** Carbon dioxide exchanging between muscle cells and red blood cells  
**C.** Water moving out of the small intestine  
**D.** Sodium being reabsorbed in the kidney  
**Answer:** D. Sodium being reabsorbed in the kidney  
Active transport requires energy to move substances, such as sodium, against its concentration gradient.

**39. The key event in the transition of the amphibians from water to land is the \_\_\_\_\_\_\_\_**  
**A.** Replacement of the gills with lungs  
**B.** Possession of webbed limbs  
**C.** Limbs  
**D.** Possession of tympanic membrane  
**Answer:** C. Limbs  
The development of limbs is a key adaptation that allowed amphibians to move on land.

**40. Erythrocytes are known as \_\_\_\_\_\_\_\_**  
**A.** White blood cells  
**B.** Red blood cells  
**C.** Phagocytes  
**D.** Leucocytes  
**Answer:** B. Red blood cells  
Erythrocytes are red blood cells responsible for transporting oxygen.

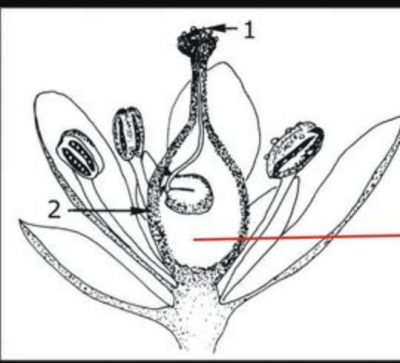
**41. Gregor Mendel is regarded as the father of \_\_\_\_\_\_**  
**A.** Variation  
**B.** Genetics  
**C.** Mycology  
**D.** Natural selection  
**Answer:** B. Genetics  
Gregor Mendel is known for his foundational work in the field of genetics.

**42. The most efficient respiratory structure used by free-living protozoans is \_\_\_\_\_\_\_\_**  
**A.** Body surface  
**B.** Gills  
**C.** Buccal cavity  
**D.** Spiracle  
**Answer:** A. Body surface  
Protozoans respire through their body surface by diffusion.

**43. Carbon (iv) oxide is added to the atmosphere when \_\_\_\_\_\_\_\_?**  
**A.** Plants build-up organic compounds  
**B.** Plants absorb mineral salts  
**C.** Sugars are completely broken down in animals  
**D.** There is thunderstorm  
**Answer:** C. Sugars are completely broken down in animals  
When animals break down sugars, carbon dioxide is produced and released into the atmosphere.

**44. The host of liver fluke are \_\_\_\_\_\_?**  
**A.** Pig and snail  
**B.** Pig and sheep  
**C.** Sheep and snail  
**D.** Pig  
**Answer:** C. Sheep and snail  
The liver fluke commonly has a sheep as a host, with snails serving as an intermediate host.

**45.**



**Use the diagram to answer the question that follows**  
  
The part labelled 1 is the \_\_\_\_\_\_\_\_

**A.** carpel

**B.** sepal

**C.** petal

**D.** stigma

**Answer:** Based on the diagram, the part labeled **1** is located at the top of the flower's reproductive structure, which is characteristic of the **stigma**—the part of the pistil where pollen lands and germinates.

**Answer: D. stigma**

**46. Which of the following factors can reduce the population of a community?**  
**A.** Immigration  
**B.** Edaphic  
**C.** Predation  
**D.** Mutualism  
**Answer:** C. Predation  
Predation can reduce the population of a community by decreasing the number of individuals through consumption.

**47. In mosses, the structure which performs the function of water absorption is the \_\_\_\_\_\_\_\_\_?**  
**A.** Root hairs  
**B.** Rhizoids  
**C.** Capsule  
**D.** Hyphae  
**Answer:** B. Rhizoids  
In mosses, rhizoids are responsible for anchoring the plant and absorbing water.

**48. How does an enzyme affect the rate of a reaction?**  
**A.** It lowers the activation energy of the reaction, increasing the reaction rate.  
**B.** It raises the activation energy of the reaction, decreasing the reaction rate.  
**C.** It lowers the activation energy of the reaction, decreasing the reaction rate.  
**D.** It raises the activation energy of the reaction, increasing the reaction rate.  
**Answer:** A. It lowers the activation energy of the reaction, increasing the reaction rate.  
Enzymes act as catalysts, lowering the activation energy required for a reaction, thereby speeding up the reaction.

**49. Insects that go through adult stage without becoming pupa are except \_\_\_\_\_\_\_\_**  
**A.** Crickets  
**B.** Cockroach  
**C.** Grasshopper  
**D.** Bees  
**Answer:** D. Bees  
Bees undergo a pupal stage as part of their metamorphosis, while crickets, cockroaches, and grasshoppers do not.

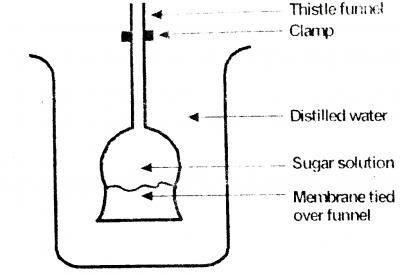
**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2018**

**1. A group of closely related organisms capable of interbreeding to produce fertile offspring are known as members of a**  
**A.** Kingdom  
**B.** Class  
**C.** Family  
**D.** Species  
**Answer:** D. Species  
A species is a group of closely related organisms that can interbreed and produce fertile offspring.

**2. A beaker of pond water containing few specimens of Euglena was placed in a dark room for two weeks. At the end of this period, the specimens of Euglena were still alive because they were**  
**A.** able to carry out holozoic nutrition  
**B.** able to carry out photosynthesis using carbon dioxide in the pond water  
**C.** better adapted to life in darkness than to life in light  
**D.** not overcrowded  
**Answer:** A. able to carry out holozoic nutrition  
Euglena can switch to holozoic nutrition (ingesting food particles) when there is no light, allowing them to survive in the dark.

**3. The cytoplasm of a cell is considered a very important component because it**  
**A.** regulates the amount of energy in the cell  
**B.** suspends all cell organelles  
**C.** is the outermost part of the cell  
**D.** is solely responsible for cell division  
**Answer:** B. suspends all cell organelles  
The cytoplasm provides a medium for the cell organelles to be suspended and facilitates cellular processes.

**4.**



**Use the diagram shown to answer the question. After an hour, the level of water in the thistle funnel will**

**A.** rise

**B.** fall

**C.** remain the same

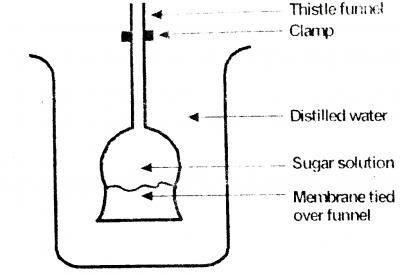
**D.** double

**Answer:** The setup in the diagram represents an experiment to demonstrate osmosis. The thistle funnel contains a sugar solution covered by a selectively permeable membrane, and it is submerged in distilled water.

Water molecules from the distilled water will move into the thistle funnel (where there is a higher concentration of solutes) through the membrane due to osmosis. As a result, the level of the solution in the thistle funnel will rise.

**Answer: A. rise**

**5.**



**Use the diagram shown to answer the question. The experiment above is used to demonstrate the process of**

**A.** transportation

**B.** water culture

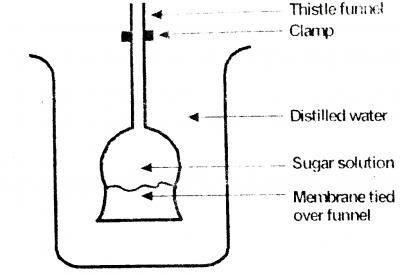
**C.** diffusion

**D.** osmosis

**Answer:** The experiment in the diagram demonstrates osmosis, as water moves from the area of higher water potential (distilled water) to the area of lower water potential (sugar solution) through a selectively permeable membrane.

**Answer: D. osmosis**

**6.**



**Use the diagram shown to answer the question. In plant cells, the role of the membrane is played by the**

**A.** nucleolus

**B.** cell wall

**C.** cytoplasm

**D.** mitochondrion

**Answer**: In plant cells, the structure that acts as the selectively permeable membrane, controlling the movement of substances in and out of the cell, is the cell membrane, not the cell wall. However, since the cell wall provides structural support and surrounds the cell membrane, it often plays a role in maintaining osmotic balance in conjunction with the cell membrane.

**Answer: B. cell wall**

**7. Red blood cells were found to have burst open after being placed in distilled water for an hour. This phenomenon is known as**  
**A.** plasmolysis  
**B.** diffusion  
**C.** haemolysis  
**D.** wilting  
**Answer:** C. haemolysis  
Haemolysis is the rupture or destruction of red blood cells when they are placed in hypotonic solutions like distilled water, causing water to enter the cells and making them burst.

**8. The curvature movement of plants in response to the stimulus of water is called**  
**A.** hydrotropism  
**B.** geotropism  
**C.** phototropism  
**D.** thigmotropism  
**Answer:** A. hydrotropism  
Hydrotropism is the growth response of plants to water, typically seen as the roots growing towards moisture.

**9. The overall reaction in glycolysis can be summarised as**  
**A.** C6H12O6 -----> C3H4O3 + 4H + ATP  
**B.** C6H12O6 -----> 2C3H4O3 + 4H + 2ATP  
**C.** C6H12O6 -----> 2C3H4O3 + 4H + ADP  
**D.** C6H12O6 -----> 2C3H4O3 + 4H + 2ADP  
**Answer:** B. C6H12O6 -----> 2C3H4O3 + 4H + 2ATP  
Glycolysis breaks down one molecule of glucose (C6H12O6) into two molecules of pyruvate (C3H4O3), with the production of energy (ATP).

**10. The longest bone in the body is the**  
**A.** humerus  
**B.** femur  
**C.** scapula  
**D.** tibia  
**Answer:** B. femur  
The femur, located in the thigh, is the longest bone in the human body.

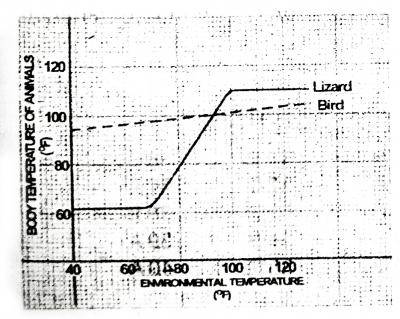
**11. Which of the following structures is not a skeletal material?**  
**A.** Chitin  
**B.** Cartilage  
**C.** Bone  
**D.** Muscle  
**Answer:** D. Muscle  
Muscle is not a skeletal material; chitin, cartilage, and bone are structural components of skeletons in various organisms.

**12. The reason why the flow of blood through the capillaries is very slow is**  
**A.** because the walls of Capillaries are very thick  
**B.** to avoid high blood pressure  
**C.** to ensure that the individual does not get dizzy  
**D.** Their large numbers and one cell-thick walls enables them to provide a large surface area through which materials can be exchanged between the blood and the body cells.  
**Answer:** D. Their large numbers and one cell-thick walls enables them to provide a large surface area through which materials can be exchanged between the blood and the body cells.  
Capillaries have a large surface area, allowing for efficient exchange of gases and nutrients, and their small diameter slows blood flow.

**13. Which of the following groups of organisms has kidney as the excretory organ?**  
**A.** Fishes, amphibians, birds, man  
**B.** Fishes, amphibians, annelids, insects  
**C.** Fishes, reptiles, birds, tapeworm  
**D.** Fishes, protozoans, amphibians, man  
**Answer:** A. Fishes, amphibians, birds, man  
These organisms have kidneys as their excretory organ, responsible for filtering waste from the blood.

**14. Which of the following features is not a characteristic of arteries? Arteries**  
**A.** possess valves at intervals throughout their length  
**B.** have thick muscular and elastic walls  
**C.** carry blood away from the heart  
**D.** transport oxygenated blood with the exception of the pulmonary artery  
**Answer:** A. possess valves at intervals throughout their length  
Arteries do not have valves because the blood pressure is high enough to prevent backflow, unlike veins, which have valves.

**15.**



**The graph below shows the results of a laboratory investigation which measured the body temperatures of a lizard and a bird under changing artificial conditions. Use it to answer the question.**

**Which of the statements below is valid?**

**A.** The bird's blood was always warmer than that of the lizard

**B.** The body temperature of the bird varied less than that of the lizard during changes in environmental temperature

**C.** The body temperature of the bird remained constant despite changes in environmental temperature

**D.** The body temperature of the lizard was always close to that of the environmental temperature

**Answer:** From the graph:

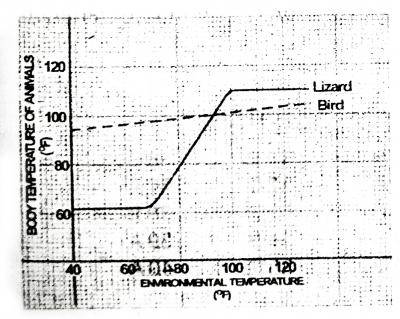
1. The **bird's body temperature** remains relatively constant despite changes in environmental temperature, indicating it is **endothermic** (warm-blooded).
2. The **lizard's body temperature** varies significantly with environmental temperature, showing it is **ectothermic** (cold-blooded).

**Analysis of the options:**

* **A. The bird's blood was always warmer than that of the lizard**: True, but not the most descriptive of the key difference.
* **B. The body temperature of the bird varied less than that of the lizard during changes in environmental temperature**: True, but not the most precise statement.
* **C. The body temperature of the bird remained constant despite changes in environmental temperature**: Correct and highlights the key feature of the bird as an endotherm.
* **D. The body temperature of the lizard was always close to that of the environmental temperature**: True for the lizard, but option C best describes the difference.

**Correct Answer: C. The body temperature of the bird remained constant despite changes in environmental temperature.**

**16.**



**The graph above shows the results of a laboratory investigation which measured the body temperatures of a lizard and a bird under changing artificial conditions. Use it to answer the question.**

**What physiological term can used to describe the regulation of the body temperature of the of the Lizard?**

**A**. Homeostasis

**B**. Homoithermy

**C.** Poikilothermy

**D.** Osmoregulation

**Answer:** The lizard's body temperature fluctuates with environmental temperature, indicating it is an ectothermic animal. This behavior is termed poikilothermy, where the organism's body temperature varies depending on the surrounding environment.

Explanation of options:

* A. Homeostasis: Refers to maintaining a stable internal environment but does not specifically address temperature regulation.
* B. Homoithermy: Refers to warm-blooded animals (endotherms) that maintain a constant body temperature, like birds and mammals.
* C. Poikilothermy: Correct term for organisms, like lizards, whose body temperature fluctuates with the environment.
* D. Osmoregulation: Refers to maintaining water and ion balance, not temperature regulation.

**Correct Answer: C. Poikilothermy**

**17. The reason why hospitals use saline solutions as a drip instead of water is**  
**A.** because salt is a preservative  
**B.** to prevent contamination of the body  
**C.** to maintain the composition of body fluids  
**D.** to increase the number of blood cells  
**Answer:** C. to maintain the composition of body fluids  
Saline solution (salt water) is used because it closely matches the body's natural fluid composition, helping maintain osmotic balance and prevent cell damage.

**18. The part of the ear which contains nerve cells sensitive to sound vibrations is the**  
**A.** cochlea  
**B.** ampulla  
**C.** tympanum  
**D.** malleus  
**Answer:** A. cochlea  
The cochlea contains hair cells that detect sound vibrations and send signals to the brain.

**19. Spectacles with convex lenses correct long-sightedness by**  
**A.** converging the light rays before they enter the eye  
**B.** diverging the light rays before they enter the eye  
**C.** reducing the light intensity before it enters the eye  
**D.** increasing the light intensity before it enters the eye  
**Answer:** A. converging the light rays before they enter the eye  
Convex lenses help focus light onto the retina for those with long-sightedness (hyperopia).

**20. A seed of a flowering plant can best be described as**  
**A.** radicle and plumule  
**B.** the developed ovule  
**C.** the embryo and endosperm  
**D.** developed ovary  
**Answer:** B. the developed ovule  
The seed is the mature ovule, containing the embryo and often endosperm.

**21. Which of the following processes removes carbon from the atmosphere?**  
**A.** putrefaction  
**B.** photosynthesis  
**C.** volcanic eruption  
**D.** burning of fuels  
**Answer:** B. photosynthesis  
Plants use photosynthesis to remove carbon dioxide from the atmosphere and convert it into oxygen and organic compounds.

**22. Which of the following cycles involves the process of precipitation and transpiration?**  
**A.** water cycle  
**B.** carbon cycle  
**C.** nitrogen cycle  
**D.** oxygen cycle  
**Answer:** A. water cycle  
Precipitation and transpiration are key processes in the water cycle.

**23. What is the critical limiting factor for plants below the photic zone in an aquatic ecosystem?**  
**A.** availability of nutrients  
**B.** availability of water  
**C.** intensity of light  
**D.** carbon dioxide concentration  
**Answer:** C. intensity of light  
Below the photic zone, light is too weak for photosynthesis to occur, making light the critical limiting factor.

**24. Which of the following instruments is used to estimate the number of plants in a habitat?**  
**A.** pooter  
**B.** pitfall trap  
**C.** quadrant  
**D.** sweep net  
**Answer:** C. quadrant  
A quadrant is used to estimate plant density by sampling a representative area.

**25. Which of the following statements is true about sandy soil?**  
**A.** has limited air space  
**B.** is light and easy to dig  
**C.** drains slowly  
**D.** is heavy and poorly aerated  
**Answer:** B. is light and easy to dig  
Sandy soil is light, easy to dig, and has good drainage.

**26. Which of the following organisms is a primary consumer?**  
**A.** dog  
**B.** sheep  
**C.** grass  
**D.** fungus  
**Answer:** B. sheep  
A primary consumer feeds on producers (plants), such as a sheep feeding on grass.

**27. Study the diagram of a food chain shown and use it to answer the question.**  
**P ---> Q ---> R ---> S ---> T**  
The organism designated P in the food chain above is normally sustained by energy from  
**A.** sunlight  
**B.** carbohydrates  
**C.** green plants  
**D.** mineral salts  
**Answer:** C. green plants  
Organism P is likely a herbivore or primary consumer that feeds on plants (producers).

**28. Study the diagram of a food chain shown and use it to answer the question.**  
**P ---> Q ---> R ---> S ---> T**  
Which of the following statements best describes the organism designated R? It  
**A.** feeds on S  
**B.** is a primary consumer  
**C.** is a producer as well as a consumer  
**D.** is a secondary consumer  
**Answer:** D. is a secondary consumer  
Organism R is likely a secondary consumer, feeding on Q (which could be a primary consumer).

**29. Which of the following diseases is not hereditary?**  
**A.** Albinism  
**B.** Scabies  
**C.** Haemophilia  
**D.** Colour blindness  
**Answer:** B. Scabies  
Scabies is a parasitic infestation, not a hereditary condition.

**30. The immediate product of meiosis in flowering plants is the**  
**A.** sporophyte  
**B.** gametophyte  
**C.** zygote  
**D.** endosperm  
**Answer:** B. gametophyte  
Meiosis produces gametophytes in plants, which are haploid structures that generate gametes (sperm and egg).

**31. DNA in eukaryotic cells is contained in the**  
**A.** central vacuole  
**B.** nucleus  
**C.** lysosome  
**D.** golgi body  
**Answer:** B. nucleus  
In eukaryotic cells, DNA is housed in the nucleus.

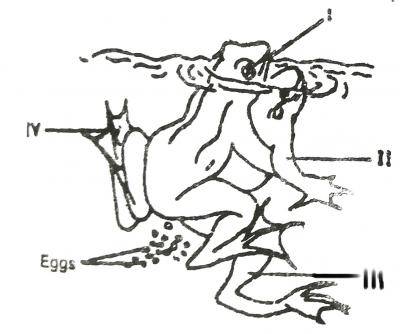
**32. A woman who is heterozygous for the disease haemophilia marries a man who is haemophilic. What percentage of their offspring would have the disease?**  
**A.** 0%  
**B.** 25%  
**C.** 50%  
**D.** 75%  
**Answer:** C. 50%  
Since the woman is heterozygous (XᴴXʰ) and the man is haemophilic (XʰY), 50% of their male offspring will inherit the Y chromosome and the Xʰ allele, making them haemophilic. 50% of their female offspring will inherit one Xᴴ from the mother and Xʰ from the father, making them carriers.

**33. Cytokinesis of mitosis is a process that ensures that**  
**A.** each daughter cell gets the necessary organelles  
**B.** there is distribution of a complete set of genes into each daughter cell  
**C.** daughter cell inherit new genetic combinations  
**D.** worn out organelles are excluded from daughter cells  
**Answer:** A. each daughter cell gets the necessary organelles  
Cytokinesis ensures that the cytoplasm and organelles are evenly divided between the two daughter cells.

**34. An animal which is active during the day is known as a**  
**A.** nocturnal animal  
**B.** diurnal animal  
**C.** terrestrial animal  
**D.** homortacmic animal  
**Answer:** B. diurnal animal  
Diurnal animals are active during the day.

**35. Evidence of evolution includes the following except?**  
**A.** fossil records  
**B.** comparative anatomy  
**C.** molecular records  
**D.** geographical distribution of organisms  
**Answer:** D. geographical distribution of organisms  
While geographical distribution of organisms supports the theory of evolution, it is not a direct piece of evidence like the others (fossils, comparative anatomy, and molecular records).

**36.**



**Use the diagram to answer the question. The diagram shows that the organisms are**

**A**. hermaphrodite

**B**. viviparous

**C**. oviparous

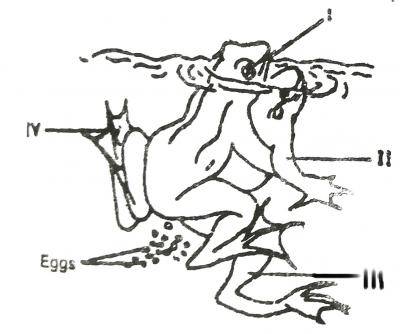
**D**. ovoviparous

**Answer:** The diagram illustrates two frogs in the process of mating, with the female frog releasing eggs into the water. Based on this, the organisms depicted are:

C. oviparous

Oviparous organisms lay eggs, and this characteristic is clearly shown in the diagram.

**37.**



**Use the diagram to answer the question. The breeding posture illustrated in the diagram is knows as**

**A.** mating

**B.** amplexus

**C.** courtship display

**D.** reproductive swimming

**Answer:** The breeding posture illustrated in the diagram, where one frog is grasping the other from behind, is known as:

**B. amplexus**

Amplexus is a common reproductive behavior in frogs and some other amphibians, where the male clasps the female to stimulate the release of eggs, which he then fertilizes. This posture ensures successful external fertilization.

**38. An accurate identification of a rapist can be carried out by conducting**  
**A.** RNA analysis  
**B.** DNA analysis  
**C.** blood group test  
**D.** behavioural tests  
**Answer:** B. DNA analysis  
DNA analysis can be used for accurate identification, as it provides a unique genetic profile for each individual.

**39. A boy who is fond of swimming in a pond finds himself passing urine with traces of blood. He is likely to have contracted?**  
**A.** schistosomiasis  
**B.** onchocerciasis  
**C.** poliomyelitis  
**D.** salmonellosis  
**Answer:** A. schistosomiasis  
Schistosomiasis is a parasitic infection that can cause blood in the urine, often contracted by swimming in contaminated water.

**40. The flippers of a whale and the fins of a fish are examples of**  
**A.** divergent evolution  
**B.** co-evolution  
**C.** continuous variation  
**D.** convergent evolution  
**Answer:** D. convergent evolution  
Convergent evolution occurs when unrelated organisms evolve similar traits, as seen with the flippers of whales and the fins of fish.

**41. The yellowish colored liquid component of blood that normally holds the blood cells in suspension is**  
**A.** serum  
**B.** plasma  
**C.** water  
**D.** thrombocyte  
**Answer:** B. plasma  
Plasma is the liquid portion of blood that carries blood cells, nutrients, and waste products.

**42. The function of pith in a plant is**  
**A.** Absorb mineral salt and nutrients from the soil  
**B.** Pith, or medulla, is a tissue in the stems of vascular plants. Pith is composed of soft, spongy parenchyma cells, which store and transport nutrients throughout the plant.  
**C.** Trap chlorophyll from the sunlight  
**D.** Removal of waste product from the plant  
**Answer:** B. Pith, or medulla, is a tissue in the stems of vascular plants. Pith is composed of soft, spongy parenchyma cells, which store and transport nutrients throughout the plant.

**43. A pollutant that is mostly associated with acid rain is**  
**A.** Nitrogen oxides  
**B.** Ozone  
**C.** Fluorine  
**D.** Carbon (IV) oxide  
**Answer:** A. Nitrogen oxides  
Nitrogen oxides (NOₓ) are a major contributor to the formation of acid rain.

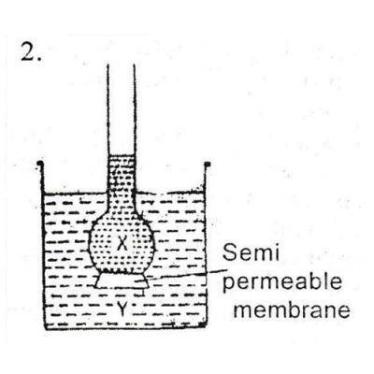
**44. What is the function of the contractile vacuole in paramecium?**  
**A.** Produces enzymes  
**B.** Gets rid of excreta  
**C.** Stores and digests food  
**D.** Gets rid of excess water  
**Answer:** D. Gets rid of excess water  
The contractile vacuole helps paramecia regulate water balance by expelling excess water.

**45. An organism which exhibits extracellular digestion is**  
**A.** Spirogyra  
**B.** Paramecium  
**C.** Amoeba  
**D.** Rhizopus  
**Answer:** D. Rhizopus  
Rhizopus (a type of fungus) digests food extracellularly by releasing enzymes into the environment.

**46. How many days are used for incubation of an egg to release a chick?**  
**A.** 21  
**B.** 22  
**C.** 20  
**D.** 23  
**Answer:** A. 21  
It typically takes 21 days for an egg to hatch and release a chick.

**47. The four classes of cnidarians include the following except**  
**A.** Turbellaria  
**B.** Anthozoa  
**C.** Scyphozoa  
**D.** Cubozoa  
**Answer:** A. Turbellaria  
Turbellaria is a class of flatworms, not cnidarians. Cnidarians include Anthozoa, Scyphozoa, and Cubozoa.

**48.**



**What would happen if solution Y is more concentrated than solution X in fig 2**

**A.** The level of X would rise, Y would falls

**B.** The level of X would rise, Y would rise

**C.** The level of X and Y stands the same

**D.** The level of Y would rise, X would fall.

**Answer:** If solution Y is more concentrated than solution X, osmosis will occur. This means water (the solvent) will move from the area of lower solute concentration (solution X) to the area of higher solute concentration (solution Y) through the semi-permeable membrane. As a result:

**A. The level of X would rise, Y would fall.**

The water from solution X will move into solution Y, causing the level of solution X to rise and the level of solution Y to fall. Osmosis strives to balance the concentration of solutes on both sides of the membrane.

This is a classic example of how osmosis works to equalize concentrations.

**49. Physiological adaptation to very dry conditions in animals demonstrates**  
**A.** Xeromorphism  
**B.** Hibernation  
**C.** Aestivation  
**D.** Rejuvenation  
**Answer:** A. Xeromorphism  
Xeromorphism refers to adaptations that help animals or plants survive in very dry conditions.

**50. The hormones secreted by the pancreas serve to**  
**A.** Facilitate the development of facial hairs  
**B.** Raise the level of calcium in the blood  
**C.** Lower blood glucose level  
**D.** Make the body react to emergencies  
**Answer:** C. Lower blood glucose level  
The pancreas secretes insulin, which helps lower blood glucose levels.

**51. Blood circulation in a mammal is said to be double because**  
**A.** It passes twice through the heart in a complete circuit  
**B.** It moves in both arteries and veins  
**C.** It circulates in both the hands and other organs  
**D.** The heart contains auricles and ventricles  
**Answer:** A. It passes twice through the heart in a complete circuit  
In mammals, blood flows through the heart twice—once for oxygenation and once to deliver oxygenated blood to the body.

**52. Examples of animals with mammary glands include the following except**  
**A.** Cow  
**B.** Goat  
**C.** Pig  
**D.** Hen  
**Answer:** D. Hen  
Hens are birds and do not have mammary glands, unlike mammals.

**53. The hygrometer is used for measuring**  
**A.** Relative Humidity  
**B.** Specific Gravity  
**C.** Rainfall  
**D.** Salinity  
**Answer:** A. Relative Humidity  
A hygrometer measures the relative humidity in the atmosphere.

**54. Mineral salts can be absorbed into roots by**  
**A.** Osmosis only  
**B.** Osmosis and diffusion  
**C.** Diffusion and active transport  
**D.** Imbibition only  
**Answer:** C. Diffusion and active transport  
Mineral salts are absorbed into roots through both diffusion and active transport.

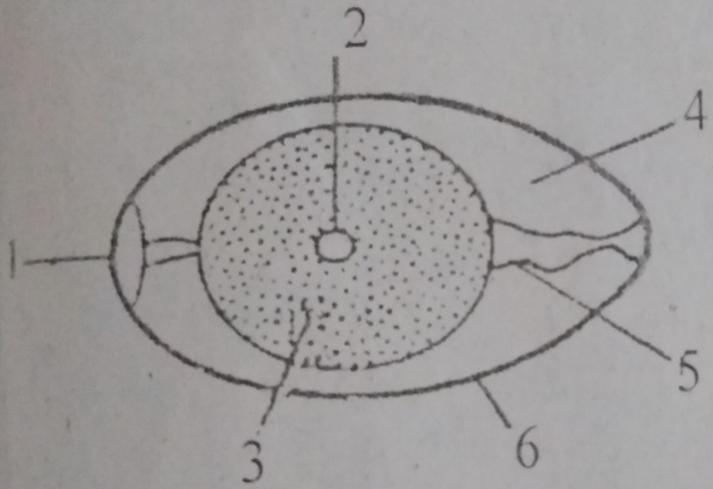
**55. Which is an animal without red blood cells?**  
**A.** Frog  
**B.** Earthworm  
**C.** Snake  
**D.** Peacock  
**Answer:** B. Earthworm  
Earthworms do not have red blood cells; they use hemoglobin dissolved in their body fluids.

**56. The temporary union of two organisms and the exchange of micronuclear elements is called**  
**A.** Conjugation  
**B.** Binary fusion  
**C.** Extrapolation  
**D.** Interexchange  
**Answer:** A. Conjugation  
Conjugation is a form of sexual reproduction involving the exchange of genetic material.

**57. A plant tissue that carries water and mineral salts is**  
**A.** Xylem  
**B.** Cortex  
**C.** Phloem  
**D.** Cambium  
**Answer:** A. Xylem  
Xylem is responsible for transporting water and mineral salts in plants.

**58. Which of the following relationships involves only one organism?**  
**A.** Saprophytism  
**B.** Commensalism  
**C.** Parasitism  
**D.** Symbiosis  
**Answer:** A. Saprophytism  
Saprophytism involves a single organism feeding on dead or decaying organic matter.

**59.**



**Which parts provides food for the developing chick?**

**A.** 2 and 3

**B.** 4 and 5

**C.** 3 and 4

**D.** 2 and 5

**Answer:** The parts of the egg that provide food for the developing chick are the yolk and the albumen (egg white). Looking at the labels in the diagram, they correspond to:

B. 4 and 5

The yolk (2) contains fats, proteins, and essential nutrients that nourish the embryo, while the albumen (4) provides additional protein and water to support growth.

**60. The outer membrane that covers the brain is**  
**A.** Myelin sheath  
**B.** Dura mater  
**C.** Arachnoid membrane  
**D.** Pia mater  
**Answer:** B. Dura mater  
The dura mater is the tough outer membrane that protects the brain and spinal cord.

**61. The process in which plants use sunlight to synthesize nutrients from carbon dioxide and water is called**  
**A.** Locomotion  
**B.** Homeostasis  
**C.** Transpiration  
**D.** Photosynthesis  
**Answer:** D. Photosynthesis  
Photosynthesis is the process by which plants produce glucose and oxygen using sunlight.

**62. Cold-blooded animals are referred to as**  
**A.** Poikilothermic  
**B.** Homothermic  
**C.** Polythermic  
**D.** Homeostatic  
**Answer:** A. Poikilothermic  
Poikilothermic animals have body temperatures that vary with their environment.

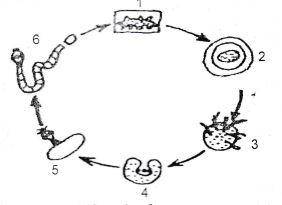
**63. The vessel carrying oxygenated blood to the tissues is**  
**A.** Arteries  
**B.** Ventricles  
**C.** Aorta  
**D.** Lung  
**Answer:** C. Aorta  
The aorta is the main artery that carries oxygenated blood from the heart to the body.

**64. Which of the following is a mixed gland?**  
**A.** Pituitary  
**B.** Adrenal  
**C.** Pancreas  
**D.** Thyroid  
**Answer:** C. Pancreas  
The pancreas is a mixed gland because it has both endocrine (hormone secretion) and exocrine (digestive enzyme secretion) functions.

**65. A group of organisms of the same species living together in a particular area is described as**  
**A.** Colony  
**B.** Community  
**C.** Population  
**D.** Niche  
**Answer:** C. Population  
A population consists of organisms of the same species living and interacting in a specific area.

**66. Tikka disease is related to the crop:**  
**A.** Mustard  
**B.** Paddy  
**C.** Groundnut  
**D.** All of the above  
**Answer:** C. Groundnut  
Tikka disease is a fungal disease that commonly affects groundnut crops.

**67.**



**At which stage in this cycle can a man be infected?**

**A.** 2

**B.** 4

**C.** 5

**D.** 6

**Answer**: Looking at the life cycle diagram of the parasitic organism, a man can be infected at:

**C. 5**

At stage 5, the larvae are either penetrating the skin or being ingested. This is the point at which the parasite enters the human body, leading to infection. This stage is crucial for the transmission of the parasite to humans.

**68. Total salt content in blood is about**  
**A.** 1.85 to 1.9%  
**B.** 11.85 to 11.9%  
**C.** 2.85 to 2.9%  
**D.** 0.85 to 0.9%  
**Answer:** D. 0.85 to 0.9%

**69. The role of scolex in tapeworm is to**  
**A.** excretion  
**B.** attachment to the host  
**C.** movement  
**D.** breathing  
**Answer:** B. attachment to the host

**70. Which of the following animals is cold-blooded**  
**A.** Cat  
**B.** Lizard  
**C.** Whale  
**D.** Bird  
**Answer:** B. Lizard

**71. The energy released by 1 gram of glucose is**  
**A.** 6 kcal  
**B.** 4 kcal  
**C.** 5 kcal  
**D.** 3 kcal  
**Answer:** B. 4 kcal

**72. What is the function of trichocyst in paramecium**  
**A.** Movement  
**B.** Defence  
**C.** Excretion  
**D.** Respiration  
**Answer:** B. Defence

**73. Man can contract tapeworm through**  
**A.** ingesting uncooked meat  
**B.** from fish  
**C.** from breathing  
**D.** through contact  
**Answer:** A. ingesting uncooked meat

**74. An example of a radially symmetrical organism is**  
**A.** Planaria  
**B.** Hydra  
**C.** Tapeworm  
**D.** Roundworm  
**Answer:** B. Hydra

**75. Maltose is a combination of glucose and**  
**A.** glucose  
**B.** sucrose  
**C.** galactose  
**D.** fructose  
**Answer:** A. glucose

**76. The vitamin which is important in the formation of the retina pigment is**  
**A.** Vitamin A  
**B.** Vitamin B  
**C.** Vitamin C  
**D.** Vitamin D  
**Answer:** A. Vitamin A

**77. In the egg of a bird, the embryo is located in the**  
**A.** Chalaza  
**B.** Yolk  
**C.** Albumen  
**D.** Airspace  
**Answer:** B. Yolk

**78. The greatest amount of energy would be obtained by the oxidation of 100kg of**  
**A.** Meat  
**B.** Butter  
**C.** Sugar  
**D.** Biscuit  
**Answer:** B. Butter

**79. Ozone hole refers to**  
**A.** hole in ozone layer  
**B.** decrease in the ozone layer in troposphere  
**C.** decrease in thickness of ozone layer in stratosphere  
**D.** increase in the thickness of ozone layer in troposphere  
**Answer:** C. decrease in thickness of ozone layer in stratosphere

**80. Accessory material in a chicken egg includes the following except**  
**A.** Albumen  
**B.** Shell membrane  
**C.** Shell  
**D.** Germinal disc  
**Answer:** D. Germinal disc

**81. Swollen, bleeding gums are another common sign of which vitamin**  
**A.** Vitamin K  
**B.** Vitamin B  
**C.** Vitamin C  
**D.** Vitamin D  
**Answer:** C. Vitamin C

**82. Double fertilisation is a unique feature of**  
**A.** Angiosperms  
**B.** Bryophytes  
**C.** Pteridophytes  
**D.** Algae  
**Answer:** A. Angiosperms

**83. The gland that is present close to the trachea**  
**A.** Pancreas  
**B.** Liver  
**C.** Adrenal  
**D.** Thyroid  
**Answer:** D. Thyroid

**84. A distinguishing feature of mammals is the possession of**  
**A.** Skin  
**B.** Scale  
**C.** Nail  
**D.** Hair  
**Answer:** D. Hair

**85. Examples of micronutrients include the following except**  
**A.** Vitamins A  
**B.** Vitamin B6  
**C.** Biotin  
**D.** Carbon  
**Answer:** D. Carbon

**86. Etiolation is caused by the influence of**  
**A.** Mineral Salts  
**B.** Water  
**C.** Carbon dioxide  
**D.** Light  
**Answer:** D. Light

**87. Botany is also known as**  
**A.** Phytology  
**B.** Phycology  
**C.** Pedology  
**D.** Plantophyta  
**Answer:** A. Phytology

**88. Name the blood cells in which the nucleus is absent**  
**A.** Lymphocytes  
**B.** Blood Platelets  
**C.** Monocytes  
**D.** Eosinophil  
**Answer:** B. Blood Platelets

**89. The damage to the ozone layer is caused by**  
**A.** Oxygen  
**B.** Nitrogen oxide  
**C.** Chlorofluorocarbons  
**D.** Sulphur dioxide  
**Answer:** C. Chlorofluorocarbons

**90. Long neck in giraffe is used to illustrate the theory of**  
**A.** Use and Disuse  
**B.** Origin of Species  
**C.** Origin of Life  
**D.** Natural Selection  
**Answer:** A. Use and Disuse

**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2019**

**1. Which of the following is a behavioural adaptation that protects prey from predators?**  
**A.** Hibernation  
**B.** Shedding of leaves  
**C.** Secreting irritating fluid  
**D.** Dormancy  
**Answer:** C. Secreting irritating fluid

**2. The period of inactivity seen in some animals during long periods of heat or drought is**  
**A.** Migration  
**B.** Aestivation  
**C.** Hibernation  
**D.** Adaptation  
**Answer:** B. Aestivation

**3. The insect trapping movements of the leaves of the Venus flytrap is a behavioural adaptation for**  
**A.** Support  
**B.** Surviving adverse weather conditions  
**C.** Obtaining food  
**D.** Dormancy  
**Answer:** C. Obtaining food

**4. Animals are said to be gregarious when**  
**A.** They survive adverse conditions of cold weather  
**B.** They transmit information from one individual to another  
**C.** They are of the same species moving together in a group  
**D.** They give an alarm to alert others to show the normal protective behaviour of the group when danger threatens  
**Answer:** C. They are of the same species moving together in a group

**5. The type of nutrition shown by Spirogyra is**  
**A.** Symbiosis  
**B.** Holozoic  
**C.** Chemosynthetic  
**D.** Holophytic  
**Answer:** D. Holophytic

**6. Raw materials required by green plants to manufacture their food are**  
**A.** Mainly fluids  
**B.** Inorganic substances  
**C.** Living materials  
**D.** Mainly gases  
**Answer:** B. Inorganic substances

**7. Which of the following pairs of organisms are photosynthetic?**  
**A.** Amoeba and Paramecium  
**B.** Euglena and Chlamydomonas  
**C.** Volvox and Rhizopus  
**D.** Nostoc and Plasmodium  
**Answer:** B. Euglena and Chlamydomonas

**8. The type of nutrition in which two organisms of different species live together and derive nutrients from each other is**  
**A.** Symbiotic nutrition  
**B.** Saprophytic nutrition  
**C.** Holozoic nutrition  
**D.** Holophytic nutrition  
**Answer:** A. Symbiotic nutrition

**9. Which of the following statements about the similarities in plant and animal transport is correct?**  
**A.** Materials and hormones are transported in fluid form  
**B.** The transport medium is made up of only tissues  
**C.** Their materials are transported in the same vessels  
**D.** Diffusion is not required  
**Answer:** A. Materials and hormones are transported in fluid form

**10. Which of the following describes the function of lymph?**  
**A.** Temperature regulation  
**B.** Production of antibodies  
**C.** Engulfing  
**D.** Body defence  
**Answer:** D. Body defence

**11. One of the major ways in which the blood is able to defend the body against disease-causing organisms is**  
**A.** Absorption of fatty acids and glycerol  
**B.** Clumping  
**C.** Single circulation  
**D.** Translocation  
**Answer:** B. Clumping

**12. Which of the following is not a transmittable character in plants?**  
**A.** Habit of growth  
**B.** Resistance to environmental factors  
**C.** Life span  
**D.** Haemophilia  
**Answer:** D. Haemophilia

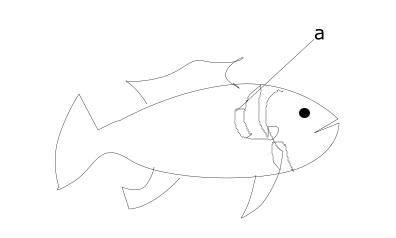
**13. Inheritable characters/features possessed by an organism can be referred to as**  
**A.** Genes  
**B.** Locus  
**C.** Traits  
**D.** Allelomorphs  
**Answer:** C. Traits

**14. One of the following is a process of transmission of hereditary characteristics by chromosomes**  
**A.** Genes relating to the same character occupy identical locations on the chromosomes  
**B.** Separation of homologous chromosomes into four daughter cells  
**C.** Separation of gametes during fertilization  
**D.** Dictating the formation of a protein by a gene in a chromosome  
**Answer:** A. Genes relating to the same character occupy identical locations on the chromosomes

**15. The attachment of the embryo to the wall of the uterus is called**  
**A.** Ovulation  
**B.** Implantation  
**C.** Gametogenesis  
**D.** Placentation  
**Answer:** B. Implantation

**16. Which of the reproductive system in mammals secretes a part of the seminal fluid which raises the pH of the fluid in the female reproductive system?**  
**A.** Cowper's gland  
**B.** Prostate gland  
**C.** Vas deferens  
**D.** Seminal vesicle  
**Answer:** B. Prostate gland

**17.**



**The part labelled a in the above diagram is used for**

**A.** Detection of pressure in water

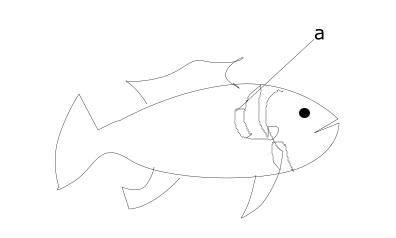
**B.** Maintaining buoyancy in water

**C.** Gaseous exchange

**D.** Movement in water

**Answer:** The part labelled "a" in the diagram is used for **C. Gaseous exchange.**

**18.**



**The above organism can be classified under which phylum in the animal kingdom**

**A.**Nematoda

**B.**Chordata

**C.**Porifera

**D.**Annelida

**Answer:** The organism shown in the diagram can be classified under **B. Chordata.**

**19.** **One important characteristic of green plants is that they**  
A. possess specialized sense organs  
B. are usually motile  
C. are autotrophic  
D. respond slowly to stimuli  
**Answer:** C. are autotrophic

**20.** **A virus can sometimes be regarded as a living organism because it**  
A. causes diseases in plants and animals  
B. exists in a variety of shapes  
C. is easily visible with the aid of an electron microscope  
D. reproduces in living cells  
**Answer:** D. reproduces in living cells

**21.** **A population is best described as**  
A. a group of the same species of organisms living together  
B. a group of animals and plants living together  
C. a group of insects and grasses  
D. different species of wild animals  
**Answer:** A. a group of the same species of organisms living together

**22.** **The number of times an organism occurs within a given area of a habitat is referred to as**  
A. Population growth rate  
B. Population frequency  
C. Population growth rate  
D. Population density  
**Answer:** D. Population density

**23.** **Reading the verdict of a case by a magistrate is an example of**  
A. A reflex action  
B. An instinct  
C. A conditioned reflex  
D. A voluntary action  
**Answer:** D. A voluntary action

**24.** **Which of the following structures controls the activities of the living cell?**  
A. Nucleus  
B. Centrosome  
C. Mitochondrion  
D. Golgi body  
**Answer:** A. Nucleus

**25.** **Which of the following are components of glomerular filtrate?**  
A. All the components of blood except mineral salts  
B. Water and salt only  
C. All the components of blood except plasma protein and cells  
D. Blood cells, amino acids, salts, and nitrogenous wastes  
**Answer:** C. All the components of blood except plasma protein and cells

**26.** **The sum total of adaptive changes from pre-existing forms that have taken place over a long time resulting in diversity of forms, structures, and functions among organisms is referred to as**  
A. Specification  
B. Inorganic Evolution  
C. Evolution  
D. Organic Evolution  
**Answer:** D. Organic Evolution

**27.** **The specific portion of a habitat which is occupied by a particular species is referred to as**  
A. Ecological population  
B. Ecological niche  
C. Biotic community  
D. Ecosystem  
**Answer:** B. Ecological niche

**28.** **In plants, respiration occurs in**  
A. The stomata and lenticel only  
B. Mesophyll cells only  
C. All living cells  
D. The root only  
**Answer:** C. All living cells

**29.** **Which of the following is an example of discontinuous variation?**  
A. The range in height of a pea plant from 30cm to 50cm  
B. Offsprings including two male cats and three female cats  
C. The color of pea plants grown in the dark  
D. The adult body weight ranging from 50kg to 95kg  
**Answer:** B. Offsprings including two male cats and three female cats

**30.** **Which of the following types of soil has the highest water-retaining capacity?**  
A. Loam  
B. Laterite  
C. Clay  
D. Sand  
**Answer:** C. Clay

**31.** **Rabbits cannot survive in an aquatic habitat because they have**  
A. fore and hind limbs  
B. no gills  
C. no fins  
D. no scales  
**Answer:** B. no gills

**32.** **Which of the following substances pass through the root cell membrane by osmosis?**  
A. Cell sap  
B. Carbon dioxide  
C. Oxygen  
D. Water  
**Answer:** D. Water

**33.** **Trees in Savanna habitats usually have thick bark which mainly**  
A. Reduces the rate of transpiration  
B. Protects them from the scorching sun  
C. Protects them from heavy winds  
D. Resists bush fires  
**Answer:** D. Resists bush fires

**34. Competition among individuals of a population increases the**  
A. Number of organisms  
B. Availability of nutrient supply  
C. Survival of the fittest  
D. Enlargement of the territory  
**Answer:** C. Survival of the fittest

**35. In natural selection, Darwin proposed that evolution occurred because of the following conditions except**  
A. that nature selects those that will survive to reproduce their kind  
B. there is a fierce competition among the offspring  
C. that the weaker offspring are eliminated  
D. food and other needs are abundant  
**Answer:** D. food and other needs are abundant

**36. Which of the following substances has the highest amount of energy in joules per unit weight?**  
A. Carbohydrates  
B. Fats  
C. Proteins  
D. Vitamins  
**Answer:** B. Fats

**37. Which of the following pairs of scientists discovered the Rhesus factor in human blood?**  
A. Hooke and Lavine  
B. Darwin and Landsteiner  
C. Landsteiner and Lavine  
D. Hooke and Darwin  
**Answer:** C. Landsteiner and Lavine

**38. The study of an individual organism or a single species of organism and its environment is**  
A. Autecology  
B. Ecological concepts  
C. Synecology  
D. Biotic composers  
**Answer:** A. Autecology

**39. Which of the following is a nitrifying bacterium?**  
A. Rhizobium  
B. Nitrobacter  
C. Azotobacter  
D. Pseudomonas  
**Answer:** B. Nitrobacter

**40. Which of the following is the effect of using artificial pollination in plant breeding?**  
A. Production of healthy crops  
B. Lengthening the maturity time of crops  
C. Making crops susceptible to disease  
D. Improvement of the variety of crops  
**Answer:** D. Improvement of the variety of crops

**41. Only specially adapted micro-organisms are found in**  
A. Salty water  
B. Humid air  
C. Moist soil  
D. Mouth cavities  
**Answer:** A. Salty water

**42. Plants which can survive in extremely dry places are called**  
A. Mesophytes  
B. Xerophytes  
C. Hydrophytes  
D. Angiosperms  
**Answer:** B. Xerophytes

**43. The presence of \_\_\_\_\_\_ for swimming in a tadpole enables it to adapt in an aquatic habitat.**  
A. Gills  
B. Swim bladder  
C. Tail  
D. Fins  
**Answer:** A. Gills

**44. Possession of thin membrane enables a tapeworm to**  
A. Fasten themselves to the wall of the host's intestine  
B. Lay numerous eggs  
C. Absorb digested food from the host's intestine to their system  
D. Shield themselves inside the host's intestine with anti-enzymes in order to avoid being digested  
**Answer:** C. Absorb digested food from the host's intestine to their system

**45. Which of the following juices contains the enzyme ptyalin?**  
A. Gastric juice  
B. Succus  
C. Pancreatic juice  
D. Saliva  
**Answer:** D. Saliva

**46. Which of the following essential substances is contained in vegetables?**  
A. Chlorophyll  
B. Glucose  
C. Mineral salts  
D. Carbon dioxide  
**Answer:** C. Mineral salts

**47. Good quality food will perform the following functions in humans except**  
A. Supplying energy  
B. Providing resistance against malaria  
C. Maintaining health  
D. Sustaining growth  
**Answer:** B. Providing resistance against malaria

**48. Which of the following is considered to be the first product of photosynthesis?**  
A. Protein  
B. Starch  
C. Energized Chlorophyll  
D. Hydroxyl ions  
**Answer:** B. Starch

**49. Which of the blood corpuscles are irregular and amoeboid in shape?**  
A. Leucocytes  
B. Erythrocytes  
C. Thrombocytes  
D. Plasma  
**Answer:** A. Leucocytes

**50. Which organ removes the largest quantity of water from the blood?**  
A. Lung  
B. Skin  
C. Kidney  
D. Intestine  
**Answer:** C. Kidney

**51. The movement of blood between the heart and all other parts of the body besides the lungs is**  
A. Double circulatory system  
B. Pulmonary system  
C. Single circulation  
D. Systemic circulation  
**Answer:** D. Systemic circulation

**52. The change in the genetic makeup of an organism resulting in an inheritable characteristic which is new is**  
A. Mutation  
B. Locus  
C. Hybrid  
D. Diploid  
**Answer:** A. Mutation

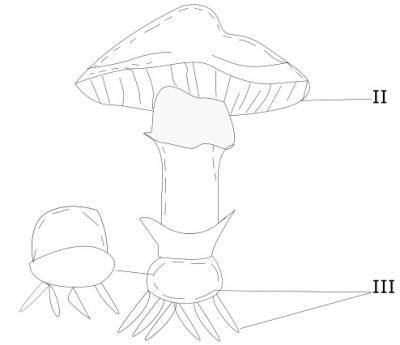
**53. The organic molecule(s) present in the nucleus is/are**  
A. DNA  
B. DNA and ATP  
C. ATP and RNA  
D. RNA  
**Answer:** A. DNA

**54. Albinism is an expression of trait controlled by**  
A. Chromosomes  
B. Recessive genes  
C. Dominant genes  
D. Mutation  
**Answer:** B. Recessive genes

**55. The male sex cells also called gametes are produced in the testes by a process called**  
A. Gametogenesis  
B. Implantation  
C. Spermatogenesis  
D. Spermatozoa  
**Answer:** C. Spermatogenesis

**56. Which of the following describes an example of fertilization in higher organisms**  
A. Fusion of sperm and egg nuclei  
B. Pollen grain landing on a sticky stigma  
C. Ejaculation of the egg and pollen grain  
D. Ejaculation of sperm into the female body  
**Answer:** A. Fusion of sperm and egg nuclei

**57.**



**The part labeled III in the above diagram is**

**A.**Root

**B.**Gills

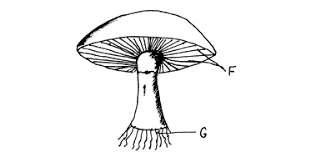
**C.**Hyphae

**D.**Rhizoids

**Answer:** The part labeled III in the above diagram is **D. Rhizoids.**

The image shows a mushroom's different parts. The part labeled III refers to the rhizoids, which are the root-like structures that anchor the mushroom to its substrate. This understanding is essential in mycology, the study of fungi.

**58.**



The organism above can be found in

**A.** Arid land

**B.** Secluded environments

**C.** Aquatic habitation

**D.** Moist environments

**Answer:** The organism above can be found in **D. Moist environments**.

The image shows a detailed drawing of a mushroom. Mushrooms, which belong to the fungi kingdom, thrive in moist environments where they can obtain the necessary nutrients for their growth.

**59. The possession of chloroplast in *Euglena viridis* enables it to**  
A. Store starch  
B. Carry out photosynthesis  
C. Reproduce  
D. Respond to light  
**Answer:** B. Carry out photosynthesis

**60. Viruses are pathogens of the following diseases except**  
A. Tuberculosis  
B. Measles  
C. Smallpox  
D. Poliomyelitis  
**Answer:** A. Tuberculosis

**61. The association between two organisms living together in which only one benefits from the association while the other is neither benefited nor harmed is**  
A. Predation  
B. Competition  
C. Commensalism  
D. Dispersal  
**Answer:** C. Commensalism

**62. Which of the following will have the least effect on the rate of change of the numbers in a population**  
A. Mutation  
B. Food Supply  
C. Disease  
D. Predation  
**Answer:** A. Mutation

**63. Which of the following controls all voluntary actions**  
A. Olfactory lobes  
B. Cerebrum  
C. Hypothalamus  
D. Pons varolii  
**Answer:** B. Cerebrum

**64. Which of the following statement describes an autonomic nervous system**  
A. It always stimulates effectors  
B. Activities are voluntary  
C. It deals with external stimuli and their responses  
D. It affects glands, cardiac muscles, and smooth muscles  
**Answer:** D. It affects glands, cardiac muscles, and smooth muscles

**65. The glomerular filtrate contains the following except**  
A. Water  
B. Urea  
C. Blood Corpuscles  
D. Glucose  
**Answer:** C. Blood Corpuscles

**66. One of the following is not a theory of natural selection stated by Charles Darwin**  
A. Characteristics acquired through use or disuse are transmitted to offspring  
B. Variations appear by themselves in a population  
C. Heredity variations are transmitted to offspring  
D. Species that are the fittest for the environment contribute more offspring to the next generation  
**Answer:** A. Characteristics acquired through use or disuse are transmitted to offspring

**67. Ecology is best defined as the study of**  
A. The characteristics of an environment  
B. The inter-relationship between living organisms and the environment  
C. Living organisms in a particular area  
D. The habitats and wildlife  
**Answer:** B. The inter-relationship between living organisms and the environment

**68. The following processes are involved during expiration in man except**  
A. The intercostal muscles relax  
B. The thoracic cavity first increases in volume  
C. The sternum moves inward  
D. The ribs are moved downwards and inwards  
**Answer:** B. The thoracic cavity first increases in volume

**69. Which of the following is an example of continuous variation?**  
A. Human blood groups  
B. Sex difference in humans  
C. Haemoglobin types  
D. Height in humans  
**Answer:** D. Height in humans

**70. One of the following is an effect of clay soil on vegetation**  
A. Supports luxuriant vegetation such as forest  
B. Supports scanty vegetation  
C. Does not support light vegetation  
D. Supports arid vegetation  
**Answer:** B. Supports scanty vegetation

**71. Which of the following factors is not considered in a terrestrial habitat?**  
A. Temperature  
B. Sunlight  
C. Humidity  
D. Turbidity  
**Answer:** D. Turbidity

**72. What type of vertebra assists in breathing alongside the ribs?**  
A. Sacral  
B. Caudal  
C. Thoracic  
D. Lumbar  
**Answer:** C. Thoracic

**73. Which of the following statements is correct about Southern Guinea Savanna in Nigeria?**  
A. It is the largest of all the biotic communities in Nigeria  
B. It has no plant species  
C. It has plant species like Iroko, Opepe, etc.  
D. It has no trees  
**Answer:** C. It has plant species like Iroko, Opepe, etc.

**74. In an ecosystem, the organism which changes light energy into stored chemical energy is the**  
A. Consumer  
B. Producer  
C. Decomposer  
D. Carnivore  
**Answer:** B. Producer

**75. In the theory of use and disuse, Lamarck proposed that evolution occurred because of the following except**  
A. There is natural selection of offspring  
B. There is great change in the environment  
C. Organisms develop specialized characters  
D. The characters are inheritable  
**Answer:** A. There is natural selection of offspring

**76. The basis of growth involves the following processes except**  
A. Cell reduction  
B. Cell division  
C. Cell enlargement  
D. Cell differentiation  
**Answer:** A. Cell reduction

**77. Which of the following organs can be considered vestigial in humans but functional in other mammals?**  
A. The liver  
B. Appendix  
C. Rectum  
D. Stomach  
**Answer:** B. Appendix

**78. The study which involves the inter-relationship between groups of organisms or species of organisms living together in an area is**  
A. Autecology  
B. Ecological niche  
C. Synecology  
D. Ecosphere  
**Answer:** C. Synecology

**79. Thunderstorm can be beneficial to plants because it**  
A. Adds lime to the soil  
B. Kills pests that attack crops  
C. Destroys some of the major crops  
D. Adds nitrate to the soil  
**Answer:** D. Adds nitrate to the soil

**80. A flowering plant having both the male and female flowers on the same plant is said to be**  
A. Regular  
B. Irregular  
C. Monoecious  
D. Dioecious  
**Answer:** C. Monoecious

**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2020.**

**1**. **The hormone which regulates the amount of glucose in the blood is called?**  
A. Adrenalin  
B. Auxin  
C. Insulin  
D. Thyroxine  
**Answer:** C. Insulin

**2.** **Deamination occurs in the?**  
A. Kidney  
B. Pancreas  
C. Spleen  
D. Liver  
**Answer:** D. Liver

**3.** **In an agricultural ecosystem, the biotic component consists of**  
A. Crops, pests, and beneficial insects  
B. Crops, temperature, and humidity  
C. Pests, beneficial insects, and water  
D. Crops, water, and soil  
**Answer:** A. Crops, pests, and beneficial insects

**4.** **Epiphytes growing on the branches of trees provide an example of the relationship known as?**  
A. Parasitism  
B. Commensalism  
C. Saprophytism  
D. Holophytism  
**Answer:** B. Commensalism

**5.** **The hypha of Rhizopus is said to be non-septate because it**  
A. Does not contain chlorophyll  
B. Has no cross wall  
C. Is vacuolated  
D. Stores oil globules  
**Answer:** B. Has no cross wall

**6.** **The function of ribosome in cells is**  
A. Protein synthesis  
B. Starch synthesis  
C. Transport of material  
D. Lipid storage  
**Answer:** A. Protein synthesis

**7.** **In which of the following does external fertilization take place?**  
A. Toad  
B. Lizard  
C. Bird  
D. Cockroach  
**Answer:** A. Toad

**8.** **The villus in the small intestine is significant because**  
A. Increases the surface area for absorption  
B. Increases the surface area for digestion  
C. Assists in mixing digested food  
D. Assists in filtering undigested food  
**Answer:** A. Increases the surface area for absorption

**9.** **The butterfly is of great economic importance because**  
A. Of its use in scientific studies  
B. It sucks nectar from flowers  
C. It adds to the beauty of the environment  
D. It pollinates flowers of crops and other plants  
**Answer:** D. It pollinates flowers of crops and other plants

**10.** **The bright colours of the comb and feathers in the peacock are for?**  
A. Sex differentiation  
B. Beauty  
C. Courtship  
D. Defence  
**Answer:** C. Courtship

**11.** **What is the term used to describe biotic and abiotic factors in the environment of the organism?**  
A. Habitat  
B. Biome  
C. Ecosystem  
D. Ecological niche  
**Answer:** C. Ecosystem

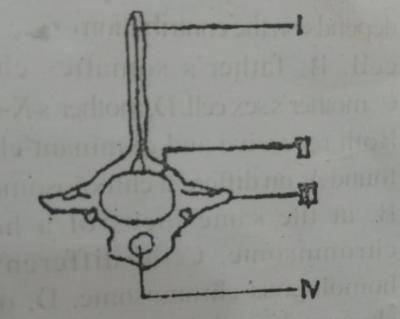
**12.** **Which of the following instruments is NOT used in measuring abiotic factors in any habitat?**  
A. Microscope  
B. Thermometer  
C. Hygrometer  
D. Wind vane  
**Answer:** A. Microscope

**13.** **The smallest living organism which shares the characteristics of both living and non-living matter are**  
A. Bacteria  
B. Fungi  
C. Viruses  
D. Protozoa  
**Answer:** C. Viruses

**14.** **The process by which a red blood cell placed in distilled water absorbs water until it bursts and releases its content into the surrounding is known as**  
A. Osmosis  
B. Plasmolysis  
C. Turgidity  
D. Hemolysis  
**Answer:** D. Hemolysis

**15.** **Which of the following waste products in plants is excreted through the stomata and lenticels?**  
A. Carbon dioxide  
B. Alkaloids  
C. Tannins  
D. Anthocyanins  
**Answer:** A. Carbon dioxide

**16.**



**Use the diagram to answer the question**

**The vertebra illustrated is**

**A.** lumber

**B**. thoracic

**C.** caudal

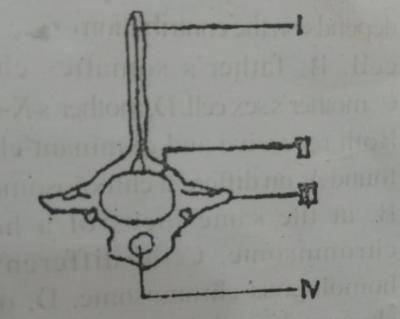
**D.** cervical

**Answer:** The vertebra illustrated is:

**D. cervical**

This can be identified by the presence of the transverse foramen, which is characteristic of cervical vertebrae. These vertebrae are located in the neck region and are part of the spinal column.

**17.**

****

**Use the diagram to answer the question**

**The neural arch is labelled**

**A**. i

**B**. ii

**C**. iii

**D**. iv

**Answer:** The neural arch is labelled:

**B. ii**

This can be identified by the location of the label pointing to the arch that encircles the spinal cord, providing protection.

**18. The excretory structure in the earthworm is the**  
**A**. Malpighian tubule  
**B**. Flame cell  
**C**. Nephridium  
**D**. Kidney  
**Answer**: C. Nephridium

**19. In which of the following vertebrates does the skin function as a respiratory surface?  
A.** Rat **B.** Lizard **C.** Fish **D.** Frog **Answer:** D. Frog

**20. The process of walking is under the control of the part of the brain called  
A.** Optic lobe **B.** Olfactory lobe **C.** Cerebellum **D.** Medulla oblongata **Answer: C. Cerebellum**

**21. The ability of the eyes to focus on both near and distant objects is termed  
A.** Image formation **B.** Refraction **C.** Hypermetropia **D.** Accommodation  
**Answer:** D. Accommodation

**22. A group of organisms of different species living in a particular area is described as a  
A.** Colony **B.** Community **C.** Population **D.** Niche **Answer:** B. Community

**23. The biological association that contributes directly to succession in a community is  
A.** Competition **B.** Predation **C.** Parasitism **D.** Commensalism  
**Answer:** A. Competition

**24. Floating microscopic heterotrophs are mostly grouped as  
A.** Phytoplankton **B.** Zooplankton **C.** Microbes **D.** Nekton **Answer:** B. Zooplankton

**25.Vaccination is carried out in order to  
A.** Check the production of poison **B.** Increase the activities of white blood cells  
**C.** Increase the number of red blood cells **D.** Stimulate the production of antibodies **Answer:** D. Stimulate the production of antibodies

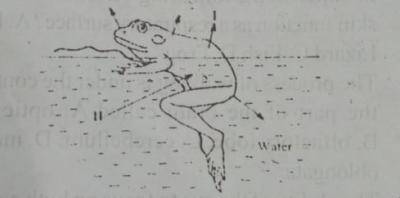
**26.For growth to occur in organisms, the rate of  
A.** Anabolism must exceed that of catabolism **B.** Catabolism must exceed that of anabolism **C.** Food storage must be low  
**D.** Food storage must be high **Answer**: A. Anabolism must exceed that of catabolism

**27. The probability of a baby being a boy or a girl depends on the contribution of the  
A.** Father's sex cells **B.** Father's somatic chromosome **C.** Mother's sex cell  
**D.** Mother's X-chromosome **Answer**: A. Father's sex cells

**28.Both recessive and dominant characters are found  
A.** On different chromosomes in the cell  
**B.** At the same locus of a homologous chromosome  
**C.** At different loci of a homologous chromosome **D.** On the same chromatid in a chromosome **Answer:** B. At the same locus of a homologous chromosome

**29.In a population of living things, the parameters of size, height, weight, and colours are examples of  
A.** Continuous variation **B.** Non-heritable variation **C.** Discontinuous variation  
**D.** Physiological variation **Answer:** A. Continuous variation

**30.**



**Use the diagram to answer the question.**

**The process of water loss and intake indicated by the arrows labelled i and ii are respectively**

**A**. evaporation and osmosis

**B**. osmosis and exhalation

**C**. osmosis and diffusion

**D**. urination and diffusion

**Answer**: From the description of the diagram:

The arrow labeled "i" points away from the frog's body, indicating a process of water loss.

The arrow labeled "ii" points towards the frog's body, indicating a process of water intake.

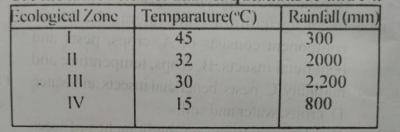
The processes indicated by the arrows labeled i and ii are respectively:

**A. evaporation and osmosis**

**31.** **The noticeable adaptation of the animal to its aquatic habitat is the possession of**  
A. Webbed digits  
B. Four limbs  
C. Wide mouth  
D. Large eyes  
**Answer:** A. Webbed digits

**32.** **Paternity disputes can most accurately be resolved through the use of**  
A. Blood group typing  
B. Finger printing  
C. Tongue rolling  
D. DNA Analysis  
**Answer:** D. DNA Analysis

**33.**



**Use the table below to answer the question.**

**High relative humidity will be expected in Zones**

A. ii and iv

B. ii and iii

C. i and iii

D. i and iv

**Answer:** High relative humidity is typically associated with higher rainfall and lower temperatures. Based on the table provided:

Zone I: Temperature 45°C, Rainfall 300 mm

Zone II: Temperature 32°C, Rainfall 2000 mm

Zone III: Temperature 30°C, Rainfall 2200 mm

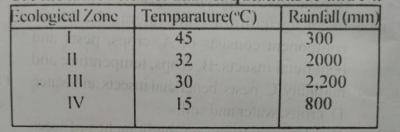
Zone IV: Temperature 15°C, Rainfall 800 mm

High relative humidity will be expected in:

**B. ii and iii**

Both Zone II and Zone III have the highest amounts of rainfall, which usually indicates higher relative humidity.

**34.**



**Use the table to answer the question.**

**Which of the zones is likely to be a desert?**

**A**. i

**B**. ii

**C**. iii

**D**. iv

**Answer:** To determine which zone is likely to be a desert, we need to look at the temperature and rainfall data provided in the table. Deserts typically have very low rainfall.

Here's the information from the table:

| Ecological Zone | Temperature (°C) | Rainfall (mm) |
| --- | --- | --- |
| I | 45 | 300 |
| II | 32 | 2000 |
| III | 30 | 2200 |
| IV | 15 | 800 |

Given that Zone I has the highest temperature and the lowest rainfall (45°C and 300 mm), it matches the characteristics of a desert.

**Therefore, the answer is:**

**A. i**

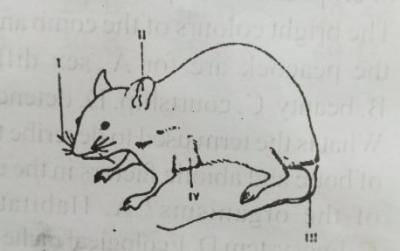
**35.When bacteria swim from cold to warm regions, this is known as**  
A. Positive phototaxis  
B. Negative phototaxis  
C. Positive thermotaxis  
D. Negative chemotaxis  
**Answer:** C. Positive thermotaxis

**36.The only caste in the termite colony whose members can feed themselves are the**  
A. Workers  
B. Reproductives  
C. Soldiers  
D. Nymphs  
**Answer:** A. Workers

**37.Which of the following is the best explanation for a child who is phenotypically short and born of two tall parents**  
A. Both parents possess genes for shortness  
B. The father possesses a gene for shortness  
C. Nature makes the child short  
**Answer:** A. Both parents possess genes for shortness

**38.Which of the following vertebrates has the most simple structured heart**  
A. Reptile  
B. Fish  
C. Mammal  
D. Amphibian  
**Answer:** B. Fish

**39.**



Use the diagram to answer the question.

The type of protective adaption exhibited by the animal is

**A.** disruptive colouration

**B.** flash colouration

**C.** countershading colouration

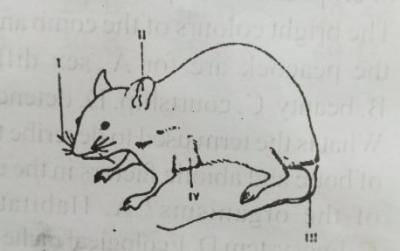
**D.** warning colouration

**Answer:** The type of protective adaptation exhibited by the animal is:

**C. countershading colouration**

Countershading coloration is a form of camouflage where the animal's coloration is darker on the upper side and lighter on the underside, helping it blend into its surroundings and avoid predators**.**

**40.**



**Use the diagram to answer the question.**

**The structure labelled i is**

**A**. photosensitive

**B**. radiosensitive

**C.** chemoreceptive

**D.** tactile

**Answer:** The image you provided shows a diagram of a rodent, likely a mouse, with various parts of its body labeled with Roman numerals (I, II, III, IV). The structure labeled "I" appears to be the whiskers of the rodent.

Therefore, the structure labelled i is:

**D. tactile**

Whiskers are sensitive to touch and are used by rodents to navigate their environment and detect objects around them.

**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2021.**

**1. One of the functions of the xylem is?**  
A. strengthening the stem  
B. manufacturing food  
C. reducing loss of water  
D. conducting manufactured food  
**Answer:** A. strengthening the stem

**2. Which of the statements below is not characteristic of wind-pollinated flowers?**  
A. Stigmas are usually large and feathery  
B. Nectary is usually absent  
C. The pollen grains have rough spiny surfaces  
D. The flowers are not scented  
**Answer:** C. The pollen grains have rough spiny surfaces

**3. Some of the features of an animal are scales, teeth, nares, and backbone. The animal is likely to be a?**  
A. toad  
B. bird  
C. lizard  
D. rat  
**Answer:** C. lizard

**4. Choose the sequence which represents the correct order of organisms in a food chain**  
A. Grass, snake, toad, grasshopper, hawk  
B. Grass, grasshopper, toad, snake, hawk  
C. Grass, grasshopper, snake, toad, hawk  
D. Grass, snake, grasshopper, toad, hawk  
**Answer:** B. Grass, grasshopper, toad, snake, hawk

**5. Flatworms and roundworms are said to be invertebrates because?**  
A. they are small animals  
B. they can live inside the vertebrates  
C. some of them are unicellular  
D. they have no backbones  
**Answer:** D. they have no backbones

**6. When a Spirogyra cell is immersed in a salt solution more concentrated than its cell sap, it?**  
A. remains unchanged  
B. takes up water and bursts  
C. absorbs a little water  
D. loses water and shrivels  
**Answer:** D. loses water and shrivels

**7. Which of the following is NOT regarded as a pollutant on land or in the air?**  
A. Smoke  
B. Nitrogen  
C. Noise  
D. Sulphur dioxide  
**Answer:** B. Nitrogen

**8. The initial volume of water poured into a bag of dry soil was 50ml and the amount that drained through was 35ml. The percentage water content of the fully soaked soil is therefore?**  
A. 46.7  
B. 25.0  
C. 20.0  
D. 30.0  
**Answer:** B. 25.0

**9. When the original king and queen of termites die, they are replaced by**  
A. the king and queen of another colony  
B. some adult reproductives from the same colony  
C. some adult workers which are specially fed to breed  
D. developing nymphs nurtured as secondary reproductives  
**Answer:** B. some adult reproductives from the same colony

**10. In demonstrating the importance of mineral elements in plants, the culture bottle must be darkened to?**  
A. prevent algal growth in culture solution  
B. allow root growth  
C. prevent breakdown of mineral elements  
D. prevent photosynthesis in the root  
**Answer:** A. prevent algal growth in culture solution

**11. In the mammalian respiratory system, exchange of gases occurs in the?**  
A. lungs  
B. bronchi  
C. bronchioles  
D. alveoli  
**Answer:** D. alveoli

**12. Aged erythrocytes are destroyed in the?**  
A. pancreas  
B. liver  
C. lymph nodes  
D. kidney  
**Answer:** B. liver

**13. The villus in the small intestine is significant because it?**  
A. increases the surface area for absorption  
B. increases the surface area for digestion  
C. assists in mixing digested food  
D. assists in filtering undigested food  
**Answer:** A. increases the surface area for absorption

**14. Which of the following food substances will produce a brick-red colour when warmed with Benedict's solution?**  
A. Glucose  
B. Starch  
C. Egg White  
D. Maltose  
**Answer:** A. Glucose

**15. The blood vessel which carries blood from the alimentary canal to the liver is the?**  
A. hepatic artery  
B. hepatic vein  
C. hepatic portal vein  
D. mesenteric artery  
**Answer:** C. hepatic portal vein

**16. Which of the following is TRUE of the process of conjugation in Paramecium?**  
A. Micronucleus disintegrates  
B. Each ex-conjugant divides only once  
C. Macronucleus undergoes division  
D. Each micronucleus divides twice  
**Answer:** D. Each micronucleus divides twice

**17. People who suck petrol with their mouths run the risk of increasing in their blood the concentration of**  
A. iron  
B. lead  
C. calcium  
D. magnesium  
**Answer:** B. lead

**18. Which of the following is a measure for the control of bilharzia?**  
A. Cutting low bushes around homes  
B. Application of molluscicides in water bodies  
C. Screening windows and doors with mosquito nets  
D. Application of herbicides in water bodies  
**Answer:** B. Application of molluscicides in water bodies

**19. The appendicular skeleton is composed of the pectoral girdle?**  
A. pelvic girdle, fore and hind limbs  
B. pelvic girdle and fore limbs  
C. lumbar vertebrae and pelvic girdle  
D. lumbar vertebrae, fore and hind limbs  
**Answer:** A. pelvic girdle, fore and hind limbs

**20. A freshwater plant such as water lily can solve the problem of buoyancy by the possession of?**  
A. aerenchyma tissues  
B. dissected leaves  
C. thin cell walls of the epidermis  
D. water-repelling epidermis  
**Answer:** A. aerenchyma tissues

**21. The correct sequence for the perception of smell in mammals is?**  
A. chemicals --> olfactory nerve endings --> brain  
B. dissolved chemicals --> nasal sensory cells --> brain  
C. chemicals --> mucus membrane sensory cells --> brain  
D. dissolved chemicals --> sensory cells --> olfactory nerve --> brain  
**Answer:** D. dissolved chemicals --> sensory cells --> olfactory nerve --> brain

**22. Which combination of the above can cause rapid over-crowding in climax biotic communities and human settlements?**  
A. II and III  
B. I and III  
C. I and IV  
D. I and II  
**Answer:** B. I and III

**23. What is the percentage of occurrence of Imperata spp?**  
A. 35%  
B. 16%  
C. 46%  
D. 23%  
**Answer:** C. 46%

**24. When a marine fish was taken from the ocean and put in a tank of fresh water, it died after a short period because?**  
A. the tank was too small compared to the large ocean  
B. the body cells of the fish swelled and burst as a result of the hypotonic fresh water  
C. the body cells of the fish shrank as their sap was hypertonic to the freshwater  
D. there was no food in the tank, so the fish starved  
**Answer:** B. the body cells of the fish swelled and burst as a result of the hypotonic fresh water

**25. If a DNA strand has a base sequence TCA, its complementary strand must be?**  
A. ATG  
B. TAG  
C. GAT  
D. AGT  
**Answer:** D. AGT

**26. The two key cations involved in the action potential of nervous transmissions are?**  
A. Na+ and Fe²⁺  
B. Mg²⁺ and K⁺  
C. Na⁺ and K⁺  
D. Fe²⁺ and Mg²⁺  
**Answer:** C. Na⁺ and K⁺

**27. The order of evolutionary advancement of the above vertebrates is?**  
A. I, II, III, IV  
B. I, IV, III, II  
C. II, III, IV, I  
D. IV, III, II, I  
**Answer:** C. II, III, IV, I

**28. Which of the following produces both hormones and enzymes?**  
A. Ileum  
B. Pancreas  
C. Gall bladder  
D. Kidney  
**Answer:** B. Pancreas

**29. The correct sequence of the movement of urea during urine formation is?**  
A. glomerulus --> Bowman's capsule -> convoluted tubule --> Henle's loop -> collecting tubule  
B. glomerulus -> Bowman's capsule -> convoluted tubule -> Henle's loop -> convoluted tubule -> collecting tubule  
C. convoluted tubule -> glomerulus --> Henle's loop -> Bowman's capsule -> collecting tubule  
D. convoluted tubule -> Bowman's capsule -> Henle's loop -> glomerulus -> collecting tubule  
**Answer:** A. glomerulus --> Bowman's capsule -> convoluted tubule --> Henle's loop -> collecting tubule

**30. The order of passage of food in the digestive system is?**  
A. ileum --> caecum --> large intestine --> rectum  
B. ileum --> colon --> caecum --> rectum  
C. large intestine --> ileum --> caecum --> rectum  
D. colon --> caecum --> ileum --> rectum  
**Answer:** A. ileum --> caecum --> large intestine --> rectum

**31. Determine the percentage of water in the given soil sample?**  
A. 20%  
B. 25%  
C. 40%  
D. 60%  
**Answer:** D. 60%

**32. Which of the above structures is correctly matched with the organisms in which it is found?**  
A. II  
B. I  
C. IV  
D. III  
**Answer:** C. IV

**33. The sequence of the one-way gaseous exchange mechanism in a fish is?**  
A. mouth --> operculum --> gills  
B. mouth --> gills --> operculum  
C. operculum --> gills --> mouth  
D. gills --> operculum --> mouth  
**Answer:** B. mouth --> gills --> operculum

**34. Which of the following is true in blood transfusion?**  
A. A person of blood group AB can donate blood only to another person of blood group AB  
B. Persons of blood groups A and B can donate or receive blood from each other  
C. A person of blood group AB can receive blood only from persons of blood group A or B  
D. A person of blood group O can donate only to a person of blood group O  
**Answer:** A. A person of blood group AB can donate blood only to another person of blood group AB

**35. The plants that grow in deserts or very dry areas are referred to as?**  
A. hydrophytes  
B. epiphytes  
C. xerophytes  
D. mesophytes  
**Answer:** C. xerophytes

**36. The most abundant group of organisms in the animal kingdom?**  
A. Mammalia  
B. Aves  
C. Insecta  
D. Annelida  
**Answer:** C. Insecta

**37. The movement of part of a plant in response to an external stimulus of no particular direction is?**  
A. taxism  
B. tropism  
C. haptotropic movement  
D. nastic movement  
**Answer:** D. nastic movement

**38. The mutation theory of organic evolution was propounded by?**  
A. Gregor Mendel  
B. Hugo de Vries  
C. Jean Lamarck  
D. Charles Darwin  
**Answer:** B. Hugo de Vries

**39. If both parents are heterozygous for a trait, the probability that an offspring will be recessive for that trait is?**  
A. 1/2  
B. 1/4  
C. 1  
D. 3/4  
**Answer:** B. 1/4

**40. Blood circulation in a mammal is said to be double because?**  
A. it passes twice through the heart in a complete circuit  
B. it moves in both arteries and veins  
C. it circulates in both the heart and other organs  
D. the heart contains auricles and ventricles  
**Answer:** A. it passes twice through the heart in a complete circuit

**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2022.**

**1. Sources of air pollutants are?**  
A. industrial chimneys, burning fossil oils and river dams  
B. sulphur dioxide, acid rain and pesticides  
C. sulphur dioxide, vehicle exhausts, and aerosols  
D. sewage, smoke and old vehicles  
**Answer:** C. sulphur dioxide, vehicle exhausts, and aerosols

**2. The body of a snail is divided into head?**  
A. thorax and abdomen  
B. visceral mass and abdomen  
C. thorax and foot  
D. visceral mass and foot  
**Answer:** D. visceral mass and foot

**3. An adaptation for defense in animals is?**  
A. croaking of a male toad  
B. basking in lizard  
C. spines in porcupine fish  
D. huddling together of penguins  
**Answer:** C. spines in porcupine fish

**4. The movement of Euglena towards the source of light is a?**  
A. tropic movement  
B. tactic movement  
C. nastic movement  
D. kinetic movement  
**Answer:** B. tactic movement

**5. During mitosis, the stage at which chromosomes line up around the equator is?**  
A. telophase  
B. metaphase  
C. anaphase  
D. prophase  
**Answer:** B. metaphase

**6. The waste product of insects is?**  
A. uric acid  
B. urine  
C. mucilage  
D. sweat  
**Answer:** A. uric acid

**7. Succession that occurs on an abandoned farmland is?**  
A. tertiary  
B. secondary  
C. primary  
D. climax  
**Answer:** B. secondary

**8. In Nigeria, Southern Guinea Savanna is found in?**  
A. Borno and Sokoto  
B. Kogi and Kwara  
C. Kaduna and Cross River  
D. Kano and Niger  
**Answer:** B. Kogi and Kwara

**9. Which of the following is associated with the dark stage of photosynthesis?**  
A. Assimilation of Carbon(IV) oxide  
B. Photophosphorylation  
C. Photolysis  
D. Excitation of chlorophyll  
**Answer:** A. Assimilation of Carbon(IV) oxide

**10. The part of mammalian skin that excretes metabolic wastes is?**  
A. sweat gland  
B. horny layer  
C. Malpighian layer  
D. sebaceous gland  
**Answer:** A. sweat gland

**11. The feeding relationship that exists between a tick and a cow is?**  
A. parasitism  
B. mechanism  
C. saprophytism  
D. commensalism  
**Answer:** A. parasitism

**12. The type of fruit that is formed from a single flower having several free carpels is?**  
A. indehiscent fruit  
B. aggregate fruit  
C. simple fruit  
D. fleshy fruit  
**Answer:** B. aggregate fruit

**13. The part that performs urinogenital function in the male reproductive system is the?**  
A. seminal vesicle  
B. epididymis  
C. urethra  
D. ureter  
**Answer:** C. urethra

**14. The components of blood in man are?**  
A. red blood cells, white blood cells, plasma and water  
B. red blood cells, white blood cells, and plasma  
C. red blood cells, white blood cells, and platelets  
D. red blood cells, white blood cells, plasma and platelets  
**Answer:** D. red blood cells, white blood cells, plasma and platelets

**15. The development of big muscles by a wrestler is an example of?**  
A. acquired characteristics  
B. inherited characteristics  
C. mutation  
D. atrophication  
**Answer:** A. acquired characteristics

**16. Lack of nucleus is a feature in?**  
A. osteocyte  
B. neurone  
C. erythrocyte  
D. leucocyte  
**Answer:** C. erythrocyte

**17. A universal recipient of blood belongs to blood group?**  
A. O  
B. AB  
C. B  
D. A  
**Answer:** B. AB

**18. The internal structure of a leaf that has larger air space is?**  
A. palisade mesophyll  
B. epidermis  
C. spongy mesophyll  
D. vascular bundles  
**Answer:** C. spongy mesophyll

**19. An example of arboreal animal is?**  
A. squirrels  
B. duck  
C. pig  
D. rat  
**Answer:** A. squirrels

**20. The movement of sugars from the leaf to other parts of plant is?**  
A. guttation  
B. transpiration  
C. transportation  
D. translocation  
**Answer:** D. translocation

**21. Gaseous exchange in annelids is more advanced and efficient compared to flatworms because?**  
A. the cells of their epidermis have no blood capillaries  
B. they have well developed respiratory structures  
C. their cylindrical shape gives high surface area to volume ratio  
D. their surface area to volume ratio is very low  
**Answer:** C. their cylindrical shape gives high surface area to volume ratio

**22. The structure that joins the two strands of a chromosome together is the?**  
A. spindle  
B. cellulose  
C. centromere  
D. chromatid  
**Answer:** C. centromere

**23. When a colour blind woman marries a normal man, what is the probability of their son being colour blind?**  
A. 25%  
B. 100%  
C. 50%  
D. 0%  
**Answer:** B. 100%

**24. The correct pathway for blood flow from the heart to the tissues of mammals is?**  
A. heart-arteriole-artery-tissues  
B. heart-artery-arteriole-tissues  
C. heart-vein-venule-tissues  
D. heart-venule-vein-tissues  
**Answer:** B. heart-artery-arteriole-tissues

**25. Tall trees with buttress roots and evergreen leaves are characteristics features of?**  
A. temperate grass land  
B. Southern Guinea Savanna  
C. tropical rain forests  
D. Northern Guinea savanna  
**Answer:** C. tropical rain forests

**26. The genes crossing over occurs during?**  
A. fertilization  
B. mutation  
C. mitosis  
D. meiosis  
**Answer:** D. meiosis

**27. In genetic counseling, a man with hemoglobin formation HbA HbS is most preferred to marry a woman of?**  
A. HbA HbA  
B. HbC HbH  
C. HbM HbF  
D. HbS HbS  
**Answer:** A. HbA HbA

**28. An ecological instrument used to measure wind direction is?**  
A. Secchi disc  
B. wind vane  
C. anemometer  
D. slope gauge  
**Answer:** B. wind vane

**29. The growth of mucor on a piece of bread is?**  
A. scavenging  
B. commensalism  
C. autotrophism  
D. saprophytism  
**Answer:** D. saprophytism

**30. Conversion of atmosphere carbon into chemical bond energy occurs during the process of?**  
A. transpiration  
B. photosynthesis  
C. digestion  
D. respiration  
**Answer:** B. photosynthesis

**31. The display of male agama lizard is to?**  
A. scare predators  
B. regulate body temperature  
C. attract female for mate  
D. give invite to intruders  
**Answer:** C. attract female for mate

**32. The end product of the digestion of carbohydrate is?**  
A. amino acid  
B. glycerol  
C. glucose  
D. sucrose  
**Answer:** C. glucose

**33. The sum total of all observable features of an organism is?**  
A. phenotype  
B. heterozygous  
C. genotype  
D. homozygous  
**Answer:** A. phenotype

**34. Pentadactyl plan of the fore limbs of frog, bird, horse, whale and man is a proof of?**  
A. spontaneous generation  
B. evolution  
C. locomotion  
D. creation  
**Answer:** B. evolution

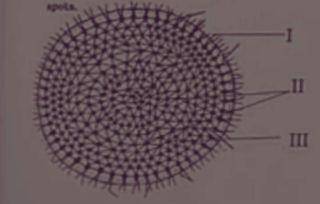
**35. The under secretion of thyroxine in children results in?**  
A. goitre  
B. gigantism  
C. kwashiorkor  
D. cretinism  
**Answer:** D. cretinism

**36. Petaloid sepals serve the function of?**  
A. carrying out photosynthesis  
B. attracting pollinating agents to a flower  
C. retaining pollen grains in the corolla tubes  
D. protecting the inner floral parts of the flower  
**Answer:** B. attracting pollinating agents to a flower

**37. The system of classification in which there are seven hierarchies from kingdom to species was introduced by?**  
A. Felix Dujardin  
B. Carolus Linneus  
C. Theodore Schwann  
D. Charles Darwin  
**Answer:** B. Carolus Linneus

**38. An adaptive feature of camel to the desert is?**  
A. ability to increase sweat production  
B. ability to pass high amount of urine  
C. ability to tolerate low degree of dehydration  
D. ability to tolerate high degree of dehydration  
**Answer:** D. ability to tolerate high degree of dehydration

**39.**



**The part labelled II is?**

**A.** pellicle

**B.** cytoplasmic connections

**C.** flagella

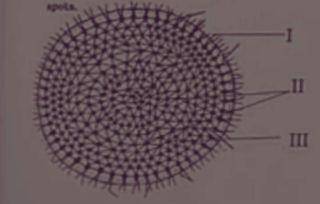
**D.** cells

**Answer:** The part labeled II is:

**B. cytoplasmic connections**

This is identified by the way the label points to the connections between cells, which typically refer to cytoplasmic connections.

**40.**



The organism above is?

**A.** chlamydomonas

**B.** algae

**C.** volvox

**D.** euglena

**Answer:** The organism illustrated is:

**C. volvox**

Volvox is a type of colonial green algae that forms spherical colonies made up of numerous individual cells. It’s an interesting organism because each cell within the colony works together, allowing the colony to move and survive as one entity.

**41.**



**The beak structure of the organism is best adapted for?**

**A**. pecking grass

**B**. killing and picking fish

**C**. pecking woods

**D**. sucking nectars

**Answer:** Based on the description provided, the beak structure of the organism is best adapted for:

**D. sucking nectars**

Long, slender beaks are typically adapted for reaching deep into flowers to access nectar. This type of beak is common among nectar-feeding birds, such as hummingbirds.

**42. One of the functions of water in seed germination is to?**  
A. dilute the embryo  
B. make the soil wet and soft  
C. activate the enzymes  
D. promote aerobic respiration

**Answer:** C. activate the enzymes

**BIOLOGY JAMB PAST QUESTION FOR THE YEAR 2023.**

1. **Which of the following is an example of a microorganism in action as a disease vector?**  
   A. Fungi decomposing dead plant material  
   B. Mosquito transmitting malaria  
   C. Bacteria causing food poisoning  
   D. Algae producing oxygen through photosynthesis  
   **Answer:** B. Mosquito transmitting malaria
2. **Which of the following is a characteristic of cells related to irritability?**  
   A. Ability to respond to stimuli  
   B. Ability to synthesize proteins  
   C. Ability to generate energy  
   D. Ability to replicate DNA  
   **Answer:** A. Ability to respond to stimuli
3. **The membrane around the vacuole is known as**  
   A. Elaioplast  
   B. Amyloplast  
   C. Tonoplast  
   D. Cytoplast  
   **Answer:** C. Tonoplast
4. **Which of the following is evidence of evolution?**  
   A. All of the above  
   B. Similarities in embryonic development  
   C. Fossils of extinct organisms  
   D. Homologous structures in different species  
   **Answer:** A. All of the above
5. **Which of the following is an example of an adaptation for survival in social insects?**  
   A. Migration to warmer climates  
   B. Production of venom for defense  
   C. Formation of complex caste systems  
   D. Hibernation during winter months  
   **Answer:** C. Formation of complex caste systems
6. **Which of the following is NOT a part of the alimentary canal?**  
   A. Oesophagus  
   B. Large intestine  
   C. Liver  
   D. Small intestine  
   **Answer:** C. Liver
7. **Which of the following is an evolutionary trend commonly observed in organisms?**  
   A. Decreased complexity over time  
   B. Increased dependence on external resources  
   C. Increased genetic diversity within populations  
   D. Decreased adaptation to the environment  
   **Answer:** C. Increased genetic diversity within populations
8. **Which of the following is a characteristic feature of Kingdom Plantae?**  
   A. Presence of chloroplasts  
   B. Ability to perform photosynthesis  
   C. Lack of cell walls  
   D. Heterotrophic mode of nutrition  
   **Answer:** B. Ability to perform photosynthesis
9. **A biome characterized by hot summer, warm winter and treeless vegetation is**  
   A. Steppe grasslands  
   B. Temperate deserts  
   C. Savannah grassland  
   D. Tropical deserts  
   **Answer:** A. Steppe grasslands
10. **Which of the following is an example of physiological variation in organisms?**  
    A. Variation in blood pressure among individuals  
    B. Variation in beak shape among finches  
    C. Differences in fur color in rabbits  
    D. Variation in leaf shape in plants  
    **Answer:** A. Variation in blood pressure among individuals
11. **Which of the following are components of the skeletal system in humans?**  
    A. Cartilage and blood vessels  
    B. Ligaments and tendons  
    C. Muscles and nerves  
    D. Bones and joints  
    **Answer:** D. Bones and joints
12. **Which of the following represents an example of ecological management and conservation through a biological association?**  
    A. Construction of a dam for hydroelectric power  
    B. Introduction of an invasive species for pest control  
    C. Clear-cutting of a forest for timber extraction  
    D. Establishment of marine protected areas  
    **Answer:** D. Establishment of marine protected areas
13. **The term cell was given by**  
    A. Robert Hooke  
    B. Schwann  
    C. De Bary  
    D. Tatum  
    **Answer:** A. Robert Hooke
14. **Which of the following is the primary organ involved in gas exchange during respiration in humans?**  
    A. Diaphragm  
    B. Bronchi  
    C. Lungs  
    D. Trachea  
    **Answer:** C. Lungs
15. **Which gland is responsible for producing the hormone insulin?**  
    A. Thyroid gland  
    B. Pituitary gland  
    C. Pancreas  
    D. Adrenal gland  
    **Answer:** C. Pancreas
16. **Most fishes do not sink in water because of the presence of:**  
    I. swim bladder  
    II. air bladder  
    III. air sacs  
    IV. air in spongy bones

II and III are correct  
B. I and II are correct  
C. I, II, III and IV are correct  
D. III and IV are correct  
**Answer:** B. I and II are correct

1. **In monohybrid inheritance, if an organism carries two different alleles for a particular gene, it is called:**  
   A. Homozygous  
   B. Dominant  
   C. Heterozygous  
   D. Recessive  
   **Answer:** C. Heterozygous
2. **What is the tissue responsible for transporting water and minerals from the roots to the rest of the plant?**  
   A. Xylem  
   B. Epidermis  
   C. Parenchyma  
   D. Phloem  
   **Answer:** A. Xylem
3. **Which of the following is an example of an abiotic ecological factor?**  
   A. Temperature  
   B. Competition  
   C. Predation  
   D. Symbiosis  
   **Answer:** A. Temperature
4. **Which of the following processes is involved in the reproduction of developing organisms?**  
   A. Budding  
   B. Germination  
   C. Fertilization  
   D. Pollination  
   **Answer:** C. Fertilization
5. **Behavioral adaptation for dealing with a hot climate could include**  
   A. Hibernating during the hottest part of the day  
   B. Large scales on the back of a lizard  
   C. Feeding during the hottest part of the day  
   D. A small kidney to conserve water  
   **Answer:** A. Hibernating during the hottest part of the day
6. **The natural place of an organism or community is known as**  
   A. Niche  
   B. Habit  
   C. Biome  
   D. Habitat  
   **Answer:** D. Habitat
7. **Which process in the nutrient cycle converts atmospheric nitrogen into a form that plants can utilize?**  
   A. Denitrification  
   B. Nitrogen fixation  
   C. Ammonification  
   D. Nitrification  
   **Answer:** B. Nitrogen fixation
8. **Which of the following functions is performed by the skin to help maintain homeostasis in the human body?**  
   A. Regulation of body temperature  
   B. Filtration of blood  
   C. Production of hormones  
   D. Digestion of food  
   **Answer:** A. Regulation of body temperature
9. **Which of the following soil types becomes less fertile due to the intense leaching caused by tropical rains?**  
   A. Yellow soil  
   B. Laterite soil  
   C. Red soils  
   D. Black soil  
   **Answer:** B. Laterite soil
10. **Which type of reproduction involves the fusion of gametes from two parents?**  
    A. Sexual reproduction  
    B. Asexual reproduction  
    C. Binary fission  
    D. Budding  
    **Answer:** A. Sexual reproduction
11. **Which processes are involved in nutrient cycling in a functioning ecosystem?**  
    A. Erosion, weathering, and sedimentation  
    B. Decomposition, evaporation, and precipitation  
    C. Nitrogen fixation, denitrification, and ammonification  
    D. Respiration, photosynthesis, and transpiration  
    **Answer:** C. Nitrogen fixation, denitrification, and ammonification
12. **What is autotrophic nutrition?**  
    A. Nutrition in which organisms obtain food by breaking down complex organic compounds.  
    B. Nutrition in which organisms obtain food from other organisms  
    C. Nutrition in which organisms obtain food by consuming both plants and animals  
    D. Nutrition in which organisms produce their own food using energy from the sun or inorganic substances  
    **Answer:** D. Nutrition in which organisms produce their own food using energy from the sun or inorganic substances
13. **The theory of evolution can be defined as**  
    A. The belief that all species were created in their current form  
    B. The hypothesis that organisms strive to improve themselves over generations  
    C. The idea that species change over time through natural processes  
    D. The concept that evolution occurs through a series of sudden and dramatic changes  
    **Answer:** C. The idea that species change over time through natural processes
14. **Which of the following is a male reproductive organ in humans?**  
    A. Uterus  
    B. Ovary  
    C. Testis  
    D. Fallopian tube  
    **Answer:** C. Testis
15. **Which of the following is an example of a behavioral adaptation for survival in animals?**  
    A. Sharp teeth  
    B. Migration  
    C. Wings  
    D. Camouflage  
    **Answer:** B. Migration
16. **Which of the following traits is not visible in a person with Down syndrome?**  
    A. Short neck  
    B. High muscle tone  
    C. Small stature  
    D. Slant eyes  
    **Answer:** B. High muscle tone
17. **What is the definition of population ecology?**  
    A. The study of interactions between organisms and their physical environment  
    B. The study of evolutionary processes and their effects on populations  
    C. The study of interactions between different populations in an ecosystem  
    D. The study of the distribution and abundance of individuals within a species  
    **Answer:** D. The study of the distribution and abundance of individuals within a species
18. **What is the term used to describe the maximum number of individuals of a species that an environment can support indefinitely?**  
    A. Ecological niche  
    B. Limiting factor  
    C. Carrying capacity  
    D. Density-dependent factor  
    **Answer:** C. Carrying capacity
19. **Which of the following statements about the heart is true?**  
    A. The heart is responsible for the production of red blood cells  
    B. The heart pumps oxygenated blood to the lungs  
    C. The heart receives blood from the kidneys and filters waste products  
    D. The heart is a muscular organ that contracts to circulate blood throughout the body  
    **Answer:** D. The heart is a muscular organ that contracts to circulate blood throughout the body
20. **What is the primary source of variation in a population?**  
    A. Gene flow  
    B. Mutation  
    C. Natural selection  
    D. Genetic drift  
    **Answer:** B. Mutation
21. **Which component of blood is responsible for carrying oxygen to the body tissues?**  
    A. Platelets  
    B. White blood cells  
    C. Red blood cells  
    D. Plasma  
    **Answer:** C. Red blood cells
22. **What are the primary products of photosynthesis?**  
    A. Carbon dioxide and water  
    B. Glucose and oxygen  
    C. Glucose and carbon dioxide  
    D. Oxygen and water  
    **Answer:** B. Glucose and oxygen
23. **The alternate form of a gene is**  
    A. Alternate type  
    B. Dominant character  
    C. Recessive character  
    D. Allele  
    **Answer:** D. Allele
24. **Which organs are part of the alimentary canal in the human digestive system?**  
    A. Salivary glands, tongue, and pharynx  
    B. Large intestine, appendix, and rectum  
    C. Stomach, liver, and gallbladder  
    D. Oesophagus, pancreas, and small intestine  
    **Answer:** B. Large intestine, appendix, and rectum
25. **Which of the following characteristics is typical of the phylum Arthropoda?**  
    A. Radial symmetry  
    B. Closed circulatory system  
    C. Endoskeleton made of bones  
    D. Presence of a segmented body  
    **Answer:** D. Presence of a segmented body
26. **Which of the following is an example of conserving resources in an ecosystem?**  
    A. Excessive use of chemical fertilizers in agriculture  
    B. Introducing invasive species to an ecosystem  
    C. Implementing sustainable fishing practices  
    D. Cutting down trees for timber production  
    **Answer:** C. Implementing sustainable fishing practices
27. **Which of the following represents the correct hierarchical organization of life from the smallest to the largest scale?**  
    A. Organs, tissues, cells, organisms, populations, communities, ecosystems  
    B. Cells, organs, tissues, organisms, populations, communities, ecosystems  
    C. Tissues, organs, cells, organisms, populations, communities, ecosystems  
    D. Cells, tissues, organs, organisms, populations, communities, ecosystems  
    **Answer:** D. Cells, tissues, organs, organisms, populations, communities, ecosystems
28. **Which of the following blood vessels carries oxygenated blood away from the heart?**  
    A. Arteries  
    B. Venules  
    C. Capillaries  
    D. Veins  
    **Answer:** A. Arteries
29. **Which of the following factors primarily affects the distribution of organisms in an ecosystem?**  
    A. Wind speed  
    B. Soil pH  
    C. Temperature  
    D. Day length  
    **Answer:** C. Temperature
30. **Which of the following is NOT a method of reproduction in animals?**  
    A. Asexual reproduction  
    B. Budding  
    C. Sexual reproduction  
    D. Sporulation  
    **Answer:** D. Sporulation
31. **Which of the following statements is true about the kingdom Fungi?**  
    A. Fungi obtain nutrients by absorbing organic matter  
    B. Fungi are photosynthetic organisms  
    C. Fungi are multicellular organisms  
    D. Fungi reproduce through the formation of seeds  
    **Answer:** A. Fungi obtain nutrients by absorbing organic matter
32. **Viviparity refers to the reproductive strategy in which**  
    A. Offspring are produced by internal fertilization  
    B. Offspring are produced by external fertilization  
    C. Offspring develop and are nourished inside the female's body  
    D. Offspring develop and are nourished outside the female's body  
    **Answer:** C. Offspring develop and are nourished inside the female's body
33. **Which of the following is the most inclusive level of classification in the Linnaean system?**  
    A. Kingdom  
    B. Phylum  
    C. Domain  
    D. Class  
    **Answer:** C. Domain
34. **Which of the following describes the inheritance of traits from parents to offspring?**  
    A. Adaptation  
    B. Evolution  
    C. Natural selection  
    D. Genetics  
    **Answer:** D. Genetics
35. **Which of the following statements best describes the role of competition in the process of adaptation?**  
    A. Competition leads to the selection of individuals with favorable traits for survival and reproduction  
    B. Competition ensures equal distribution of resources among individuals in a population  
    C. Competition leads to the development of new traits and adaptations in a population  
    D. Competition reduces the need for adaptations as individuals coexist peacefully  
    **Answer:** A. Competition leads to the selection of individuals with favorable traits for survival and reproduction
36. **Which of the following statements is true regarding sex-linked traits?**  
    A. Sex-linked traits are located on the sex chromosomes  
    B. Sex-linked traits are inherited only from the mother  
    C. Sex-linked traits are more commonly observed in females  
    D. Sex-linked traits are not influenced by hormonal factors  
    **Answer:** A. Sex-linked traits are located on the sex chromosomes
37. **Which of the following is a plant hormone responsible for promoting cell elongation and growth?**  
    A. Abscisic acid  
    B. Gibberellins  
    C. Ethylene  
    D. Cytokinins  
    **Answer:** B. Gibberellins
38. **Which of the following is a primary source of pollution in aquatic ecosystems?**  
    A. Soil erosion  
    B. Industrial discharge  
    C. Air pollution  
    D. Deforestation  
    **Answer:** B. Industrial discharge
39. **Which of the following mechanisms is responsible for providing support in plants?**  
    A. Muscles and bones  
    B. Exoskeleton  
    C. Endocrine system  
    D. Cell walls and turgor pressure  
    **Answer:** D. Cell walls and turgor pressure
40. **Metamorphosis is a biological process that involves**  
    A. The growth and development of an organism from a zygote to an adult  
    B. The change in form and structure during the life cycle of certain organisms  
    C. The regeneration of lost body parts in an organism  
    D. The transformation of an organism from an adult stage to a larval stage  
    **Answer:** B. The change in form and structure during the life cycle of certain organisms
41. **Which of the following organs is primarily responsible for excretion in humans?**  
    A. Liver  
    B. Pancreas  
    C. Kidneys  
    D. Lungs  
    **Answer:** C. Kidneys
42. **Which of the following is the correct classification of carbohydrates?**  
    A. Lipid  
    B. Phytonutrient  
    C. Macronutrient  
    D. Micronutrient  
    **Answer:** C. Macronutrient
43. **Which of the following eye defects is caused by the inability of the eye to focus light on the retina?**  
    A. Glaucoma  
    B. Myopia  
    C. Cataracts  
    D. Astigmatism  
    **Answer:** B. Myopia
44. **Germination is the process in which a seed**  
    A. Begins to photosynthesize  
    B. Develops into a mature plant  
    C. Absorbs nutrients from the soil  
    D. Breaks dormancy and starts to grow  
    **Answer:** D. Breaks dormancy and starts to grow
45. **Which of the following statements is true regarding sexual reproduction in organisms?**  
    A. It involves the fusion of gametes from two parents, resulting in offspring with genetic variation  
    B. It involves the production of offspring through a single parent, resulting in genetically identical offspring  
    C. It is a form of asexual reproduction where offspring are produced without the involvement of gametes  
    D. It does not involve the formation of gametes or the fusion of reproductive cells  
    **Answer:** A. It involves the fusion of gametes from two parents, resulting in offspring with genetic variation
46. **Which of the following is a method of asexual reproduction in plants?**  
    A. Pollination  
    B. Vegetative propagation  
    C. Seed dispersal  
    D. Fertilization  
    **Answer:** B. Vegetative propagation
47. **Which of the following plant tissues is responsible for transporting water and nutrients from the roots to the rest of the plant?**  
    A. Mesophyll  
    B. Xylem  
    C. Epidermis  
    D. Phloem  
    **Answer:** B. Xylem
48. **Which of the following statements best describes courtship behaviors in animals?**  
    A. Courtship behaviors are solely performed by males to establish dominance within a social group  
    B. Courtship behaviors involve displays and rituals performed by both males and females to attract a mate  
    C. Courtship behaviors are primarily performed by females to attract males for mating  
    D. Courtship behaviors are aggressive interactions between males competing for a female mate  
    **Answer:** B. Courtship behaviors involve displays and rituals performed by both males and females to attract a mate
49. **Which of the following best describes physiological variation in biology?**  
    A. Variations in the physiological processes and functions of organisms  
    B. Differences in physical characteristics and appearance within a population  
    C. Differences in behavior and social interactions among individuals  
    D. Variations in the genetic makeup of individuals within a species  
    **Answer:** A. Variations in the physiological processes and functions of organisms
50. **Which of the following options correctly identifies excretory organs in animals?**  
    A. Stomach, intestines, and bladder  
    B. Lungs, kidneys, and skin  
    C. Brain, spinal cord, and nerves  
    D. Heart, liver, and spleen  
    **Answer:** B. Lungs, kidneys, and skin
51. **Which of the following best describes the concept of trophic levels in a functioning ecosystem?**  
    A. The levels of ecological interactions within an ecosystem  
    B. The levels of energy flow within an ecosystem  
    C. The levels of nutrient cycling within an ecosystem  
    D. The levels of biological diversity within an ecosystem  
    **Answer:** B. The levels of energy flow within an ecosystem
52. **Which of the following statements best describes pollination in plants?**  
    A. Pollination is the process of transferring pollen from the stigma to the anther of a flower  
    B. Pollination is the process of transferring pollen from the anther to the stigma of a flower  
    C. Pollination is the process of releasing pollen into the air for dispersal  
    D. Pollination is the process of seed formation within a flower  
    **Answer:** B. Pollination is the process of transferring pollen from the anther to the stigma of a flower
53. **Which of the following best describes a natural habitat in ecology?**  
    A. An area where organisms naturally live and interact with their surroundings  
    B. A human-created environment for wildlife conservation  
    C. A controlled laboratory setting for ecological experiments  
    D. A protected area for endangered species  
    **Answer:** A. An area where organisms naturally live and interact with their surroundings
54. **Which of the following statements about viruses is true?**  
    A. Viruses can reproduce outside of a host cell  
    B. Viruses require a host cell to replicate  
    C. Viruses possess a cellular structure  
    D. Viruses are living organisms  
    **Answer:** B. Viruses require a host cell to replicate
55. **Which of the following statements is true regarding cell growth?**  
    A. Cell growth is solely influenced by external factors  
    B. Cell growth is a continuous process throughout the life of a cell  
    C. Cell growth involves an increase in the number of organelles within a cell  
    D. Cell growth occurs by cell division  
    **Answer:** B. Cell growth is a continuous process throughout the life of a cell
56. **Which of the following statements is true regarding the urinary tubule in the excretory system?**  
    A. The urinary tubule is responsible for the production of urine  
    B. The urinary tubule regulates the water and electrolyte balance in the body  
    C. The urinary tubule connects the kidneys to the bladder  
    D. The urinary tubule is the site of filtration of blood  
    **Answer:** B. The urinary tubule regulates the water and electrolyte balance in the body
57. **What is the primary function of the liver in the human body?**  
    A. Regulation of body temperature  
    B. Regulation of blood pressure  
    C. Production of hormones  
    D. Detoxification and metabolism of nutrients and drugs  
    **Answer:** D. Detoxification and metabolism of nutrients and drugs
58. **Ecological succession refers to**  
    A. The movement of organisms from one habitat to another  
    B. The competition among species for limited resources  
    C. The process of natural selection in a population  
    D. The gradual and predictable change in a community over time  
    **Answer:** D. The gradual and predictable change in a community over time
59. **Which of the following options best describes adaptation for survival in organisms?**  
    A. Adaptation is the inherited trait that increases an organism's chances of survival and reproduction in its environment  
    B. Adaptation is the process by which organisms acquire new characteristics during their lifetime  
    C. Adaptation refers to the ability of an organism to change its environment to better suit its needs  
    D. Adaptation involves the development of new traits in response to changes in the environment  
    **Answer:** A. Adaptation is the inherited trait that increases an organism's chances of survival and reproduction in its environment
60. **Digestive enzymes are responsible for**  
    A. Breaking down food into smaller molecules  
    B. Absorbing nutrients into the bloodstream  
    C. Regulating the pH of the digestive tract  
    D. Transporting food through the digestive system  
    **Answer:** A. Breaking down food into smaller molecules
61. **Which of the following is a difference between plant and animal cells?**  
    A. Plant cells have a nucleus, while animal cells do not  
    B. Plant cells have a cell membrane, while animal cells have a cell wall  
    C. Plant cells contain chloroplasts for photosynthesis, while animal cells do not  
    D. Plant cells have a central vacuole, while animal cells have multiple small vacuoles  
    **Answer:** C. Plant cells contain chloroplasts for photosynthesis, while animal cells do not
62. **Which of the following structures in the ear is responsible for transmitting sound vibrations to the auditory nerve?**  
    A. Eardrum  
    B. Ossicles  
    C. Cochlea  
    D. Auditory canal  
    **Answer:** C. Cochlea
63. Top of Form

Bottom of Form

2025 JAMB QUESTIONS & ANSWERS FROM JAMB SYLLABUS

**A:VarietyofOrganisms**

1. LIVING ORGANISMS

Question 1: What is one characteristic that distinguishes living organisms from non-living things?

A) Ability to reproduce

B) Presence of mass

C) Ability to conduct heat

D) Presence of cells

Answer:A) Ability to reproduce

Explanation: Living organisms have the ability to reproduce, either sexually or asexually, while non-living things do not have this capability

Question 2: Which of the following is a basic unit of life?

A) Tissue

B) Organ

C) Cell

D) Organism

Answer: C) Cell

Explanation: The cell is the basic structural and functional unit of all living organisms.

Question 3: What is the function of the nucleus in a cell?

A) Energy production

B) Protein synthesis

C) Genetic information storage

D) Waste removal

Answer: C) Genetic information storage

Explanation: The nucleus contains the cell’s genetic material (DNA) and controls cellular activities.

---

Question 4: Which organelle is responsible for energy production in cells?

A) Ribosome

B) Golgi apparatus

C) Mitochondria

D) Endoplasmic reticulum

Answer: C) Mitochondria

Explanation: Mitochondria are known as the "powerhouses" of the cell as they produce ATP through cellular respiration.

Question 5: What type of tissue is responsible for covering body surfaces?

A) Connective tissue

B) Epithelial tissue

C) Muscle tissue

D) Nervous tissue

Answer: B) Epithelial tissue

Explanation: Epithelial tissue lines the surfaces of organs and body cavities, providing protection and absorption.

Question 6: Which of the following organisms is unicellular?

A) Hydra

B) Paramecium

C) Onion

D) Frog

Answer: B) Paramecium

Explanation: Paramecium is a unicellular organism, whereas Hydra, onion, and frog are multicellular.

Question 7: What is the primary function of epithelial tissue?

A) Support and protection

B) Movement

C) Signal transmission

D) Storage of energy

Answer: A) Support and protection

Explanation: Epithelial tissue serves to protect underlying structures and facilitate absorption and secretion.

Question 8: What type of cell is a euglena classified as?

A) Prokaryotic

B) Eukaryotic

C) Viral

D) Fungal

Answer: B) Eukaryotic

Explanation: Euglena is a eukaryotic organism that has a defined nucleus and membrane-bound organelles.

Question 9: Which level of organization is represented by a group of similar cells working together?

A) Organ

B) Tissue

C) Organism

D) Cell

Answer: B) Tissue

Explanation: Tissue is formed when similar cells group together to perform a specific function.

Question 10: What is the main structural difference between plant and animal cells?

A) Presence of a cell wall

B) Presence of a nucleus

C) Presence of mitochondria

D) Presence of ribosomes

Answer: A) Presence of a cell wall

Explanation: Plant cells have a rigid cell wall, while animal cells do not.

Question 11: Which organelle is involved in protein synthesis?

A) Nucleus

B) Ribosome

C) Lysosome

D) Golgi apparatus

Answer: B) Ribosome

Explanation: Ribosomes are the site of protein synthesis in the cell.

Question 12: What is the primary function of chloroplasts?

A) Digestion

B) Photosynthesis

C) Respiration

D) Energy storage

Answer: B) Photosynthesis

Explanation: Chloroplasts contain chlorophyll and are responsible for converting sunlight into chemical energy through photosynthesis.

Question 13: What is the function of the vacuole in plant cells?

A) Energy production

B) Storage of substances

C) Protein synthesis

D) Signal transmission

Answer: B) Storage of substances

Explanation: Vacuoles store nutrients, waste products, and help maintain turgor pressure in plant cells.

Question 14: Which system is responsible for transporting nutrients in the body?

A) Nervous system

B) Digestive system

C) Circulatory system

D) Respiratory system

Answer: C) Circulatory system

Explanation:The circulatory system transports nutrients, gases, and waste products throughout the body.

Question 15: How do you define an organism?

A) A group of cells

B) A living entity that can carry out life processes

C) A collection of tissues

D) A system of organs

Answer: B) A living entity that can carry out life processes

Explanation: An organism is defined as any living entity that can grow, reproduce, and respond to its environment.

---

Question 16: What is the characteristic of living organisms that allows them to respond to stimuli?

A) Adaptation

B) Growth

C) Homeostasis

D) Irritability

Answer: D) Irritability

Explanation: Irritability refers to the ability of living organisms to respond to changes in their environment.

Question 17: Which of the following is NOT a characteristic of living organisms?

A) Growth

B) Movement

C) Respiration

D) Inertia

Answer: D) Inertia

Explanation: Inertia is a property of matter and does not define living organisms.

Question 18: What type of cells are found in the epidermis of plants?

A) Parenchyma

B) Sclerenchyma

C) Collenchyma

D) All of the above

Answer: A) Parenchyma

Explanation: The epidermis of plants primarily consists of parenchyma cells that provide protection and facilitate gas exchange.

Question 19: In terms of organization, which comes first: organ, tissue, or cell?

A) Organ

B) Tissue

C) Cell

D) Organism

Answer: C) Cell

Explanation: The levels of organization follow this order: cell → tissue → organ → system → organism.

Question 20: Which of the following best describes the function of lysosomes?

A) Energy production

B) Cellular digestion

C) Protein synthesis

D) Photosynthesis

Answer: B) Cellular digestion

Explanation: Lysosomes contain enzymes that break down waste materials and cellular debris.

Question 21: What type of organism is Chlamydomonas?

- A) Multicellular animal

- B) Unicellular algae

- C) Bacterial cell

- D) Fungal organism

Answer: B) Unicellular algae

Explanation: Chlamydomonas is a unicellular green alga, capable of photosynthesis.

---

Question 22: Which system is primarily responsible for reproduction in humans?

- A) Digestive system

- B) Circulatory system

-) Reproductive system

- D) Respiratory system

Answer: C) Reproductive system

Explanation: The reproductive system is responsible for producing gametes and facilitating reproduction.

--

Question 23: What is an example of a tissue in animals?

- A) Epidermis

- B) Muscle

- C) Leaf

- D) Root

Answer: B) Muscle

Explanation: Muscle tissue is an example of animal tissue that enables movement.

---

Question 24: How do plant and animal cells differ in terms of energy storage?

- A) Plants store energy as starch, and animals store it as glycogen.

- B) Both store energy as glucose.

- C) Animals only store energy as fat.

- D) Plants do not store energy.

Answer: A) Plants store energy as starch, and animals store it as glycogen.

Explanation:Plants typically store energy in the form of starch, while animals store it as glycogen.

---

Question5: What is the function of the cell membrane?

- A) Energy production

- B) Movement

- C) Protection and regulation of substance entry and exit

- D) Protein synthesis

Answer: C) Protection and regulation of substance entry and exit

Explanation: The cell membrane controls what enters and leaves the cell, providing protection.

---

Question 26: What type of cell is a typical feature of hydra?

- A) Prokaryotic

- B) Eukaryotic

- C) Viral

- D) Fungal

Answer: B) Eukaryotic

Explanation: Hydra is composed of eukaryotic cells, which have a defined nucleus and organelles.

---

Question 27: Which structure is responsible for photosynthesis in plant cells?

- A) Mitochondria

- B) Chloroplasts

-C) Nucle

- D) Ribosomes

Answer: B) Chloroplasts

Explanation: Chloroplasts are the organelles in plant cells that carry out photosynthesis.

---

Question 28: What is the primary function of the Golgi apparatus?

- A) Energy production

- B) Packaging and distribution of proteins

- C) Digestion of waste

- D) Synthesis of lipids

Answer: B) Packaging and distribution of proteins

Explanation: The Golgi apparatus modifies, sorts, and packages proteins for secretion or delivery to her orgalles

---

Question 29: What is the primary difference between prokaryotic and eukaryotic cells?

- A) Size

- B) Presence of a nucleus

- C) Type of DNA

- D) Ability to reproduce

Answer: B) Presence of a nucleus

Explanation Eukaryotic cells have a defined nucleus, while prokaryotic cells do not.

---

Question 30: In terms of levels of organization, what comes after tissue?

- A) Cell

- B) Organ

- C) System

- D) Organism

Answer: B) Organ

Explanation: The sequence is: cell → tissue → organ → system → organism.

---

Question 31: What is the function of the rough endoplasmic reticulum?

- A) Lipid synthesis

- B) Protein synthesis

- C) Energy production

- D) Waste disposal

Answer: B) Protein synthesis

Explanation: The rough endoplasmic reticulum is studded with ribosomes and is involved in synthesizing proteins.

---

\*Question 32:What type of cells are the basic building blocks of life?

- A) Tissues

- B) Organs

- C) Cells

- D) Organisms

Answer: C) Cells

Explanation: Cells are the fundamental units of structure and function in living organisms.

---

Question 33:Which tissue type connects and supports other tissues?

- A) Epithelial tissue

- B) Muscle tissue

- C) Nervous tissue

- D) Connective tissue

Answer: D) Connective tissue

Explanation: Connective tissue supports, binds together, and protects other tissues and organs.

---

Question 34: What is the primary function of plant roots?

- A) Photosynthesis

- B) Nutrient absorption

- C) Water storage

- D) Protection

Answer: B) Nutrient absorption

Explanation: Roots absorb water and minerals from the soil, supporting the plant.

---

Question 35: Which of the following structures is found in plant cells but not in animal cells?

- A) Nucleus

- B) Cell wall

- C) Mitochondria

- D) Ribosomes

Answer: B) Cell wall

Explanation:\*\* ant cells have a rigid cell wall made of cellulose, which is not present in animal cells.

---

Question 36: What is the function of the reproductive system in organisms?

- A) Digestion

- B) Movement

- C) Production of offspring

- D) Respiration

Answer:C) Production of offspring

Explanation: The reproductive system is responsible for producing gametes and facilitating reproduction.

---

Question 37: How do tissues form organs?

- A) By grouping together similar cells

- B) By forming multicellular organisms

- C) By combining different types of tissues

- D) By increasing cellular size

Answer: C) By combining different types of tissues

Explanation: Organs are formed from different types of tissues working together to perform a specific function.

---

Question 38: What is the primary function of the mitochondria?

- A) Photosynthesis

- B) Energy production

- C) Protein synthesis

- D) DNA replication

Answer: B) Energy production

Explanation: Mitochondria convert nutrients into energy in the form of ATP through cellular respiration.

---

Question 39 What is the function of the smooth endoplasmic reticulum?

- A) Protein synthesis

- B) Lipid synthesis

- C) Energy production

- D) Waste disposal

Answer: B) Lipid synthesis

Explanation: The smooth endoplasmic reticulum is involved in the synthesis of lipids and detoxification processes.

---

Question 40:Which organism is an example of a multicellular organism?

- A) Bacteria

- B) Amoeba

- C) Hydra

- D) Paramecium

Answer: C) Hydra

Explanation Hydra is a multicellular organism, while bacteria, amoeba, and paramecium are unicellular.

---

Question 41: What is the main role of the cell wall in plant cells?

- A) Energy production

- B) Protection and support

- C) Protein synthesis

- D) Photosynthesis

Answer: B) Protection and support

Explanation: The cell wall provides structural support and protection to plant cells.

---

Question 42: Which organelle is known as the "control center" of the cell?

- A) Mitochondria

- B) Ribosome

- C) Nucleus

- D) Golgi apparatus

Answer: C) Nucleus

Explanation: The nucleus contains the cell's genetic material and regulates cell activities.

---

Question 43:What is the function of epithelial tissue in the human body?

- A) Movement

- B) Protection and absorption

- C) Energy storage

- D) Signal transmission

Answer: B) Protection and absorption

Explanation: Epithelial tissue acts as a barrier and is involved in absorption and secretion processes.

---

Question 44: What is the main difference between plant and animal cells?

- A) Plant cells have a nucleus; animal cells do not.

- B) Plant cells have chloroplasts; animal cells do not.

- C) Animal cells have cell walls; plant cells do not.

- D) Both types of cells have the same structures.

Answer:\*B) Plant cells have chloroplasts; animal cells do not.

Explanation: Chloroplasts are present in plant cells for photosynthesis, while animal cells lack these organelles.

---

Question 45: What is the primary characteristic of a prokaryotic cell?

- A) Presence of a nucleus

- B) Membrane-bound organelles

- C) Simplicity and lack of a nucleus

- D) Larger size

Answer: C) Simplicity and lack of a nucleus

Explanation: Prokaryotic cells are simpler and do not have a membrane-bound nucleus.

---

Question 46: In animal tissues, what is the primary role of muscle tissue?

- A) Protection

- B) Movement

- C) Storage

- D) Absorption

Answer: B) Movement

Explanation: Muscle tissue is specialized for contraction, enabling movement in organismsm

---

Question 47: What is the role of connective tissue?

- A) Absorption of nutrients

- B) Support and binding of other tissues

- C) Energy production

- D) Signal transmission

Answer:B) Support and binding of other tissues

Explanation: Connective tissue supports, binds, and protects other tissues and organs.

---

Question 48: How do you define a multicellular organism?

- A) An organism made of only one cell

- B) An organism composed of multiple cells that work together

- C) An organism that can live independently

- D) An organism that cannot reproduce

Answer: B) An organism composed of multiple cells that work together

Explanation: Multicellular organisms consist of many cells that perform specialized functions.

---

Question 49: What is the main function of the digestive system?

- A) Energy production

- B) Breakdown and absorption of nutrients

- C) Blood circulation

- D) Gas exchange

Answer:B) Breakdown and absorption of nutrients

Explanation: The digestive system is responsible for breaking down food and absorbing nutrients into the body.

---

Question 50: In terms of organization, what comes last after organism?

- A) System

- B) Tissue

- C) Cell

- D) Organ

Answer: D) Organ

Explanation: The levels of organization follow this order: cell → tissue → organ → system → organism.

1. **Evolution**

Question 1: Which of the following is a characteristic of prokaryotes?

- A) Membrane-bound organelles

- B) Nucleus present

- C) Circular DNA

- D) Multicellular structure

Answer: C) Circular DNA

Explanation: Prokaryotes, such as bacteria, have circular DNA and lack membrane-bound organelles and a true nucleus, distinguishing them from eukaryotes.

Question 2: What is an example of a protozoan?

- A) Spirogyra

- B) Amoeba

- C) Rhizopus

- D) Cycad

Answer: B) Amoeba

Explanation: Amoeba is a type of protozoan, which is a single-celled organism belonging to the Protista kingdom.

Question 3: Which of the following organisms belongs to the Fungi kingdom?

- A) Spirogyra

- B) Mushroom

- C) Hydra

- D) Paramecium

Answer: B) Mushroom

Explanation: Mushrooms are a common example of fungi, which are characterized by their cell walls made of chitin.

Question 4: What type of plant is classified under Thallophyta?

- A) Ferns

- B) Mosses

- C) Spirogyra

- D) Cycads

Answer: C) Spirogyra

Explanation: Thallophyta includes simple, non-vascular plants like algae, with Spirogyra being a green filamentous algae.

Question 5: Which group of plants is known for having true roots, stems, and leaves?

- A) Bryophyta

- B) Pteridophyta

- C) Thallophyta

- D) Spermatophyta

Answer: B) Pteridophyta

Explanation: Pteridophyta, such as ferns, have true vascular tissues and structures including roots, stems, and leaves.

Question 6: What distinguishes gymnosperms from angiosperms?

- A) Presence of flowers

- B) Seed type

- C) Leaf structure

- D) Habitat

Answer: B) Seed type

Explanation: Gymnosperms produce seeds that are not enclosed in an ovary (like pine cones), while angiosperms produce seeds enclosed within fruits.

Question 7: What type of organism is Hydra classified as?

- A) Mollusk

- B) Coelenterate

- C) Annelid

- D) Arthropod

Answer: B) Coelenterate

Explanation: Hydra is a coelenterate (or cnidarian), characterized by its radial symmetry and presence of a gastrovascular cavity.

Question 8: Which of the following is a characteristic of flatworms?

- A) Segmentation

- B) Coelom

- C) Bilateral symmetry

- D) Exoskeleton

Answer: C) Bilateral symmetry

Explanation: Flatworms (Platyhelminthes) exhibit bilateral symmetry, which allows for a more streamlined body plan.

Question 9: What is a primary feature of roundworms?

- A) Segmented body

- B) Soft-bodied

- C) Pseudocoelom

- D) Exoskeleton

Answer: C) Pseudocoelom

Explanation: Roundworms (Nematoda) possess a pseudocoelom, which is a fluid-filled body cavity that is not completely lined by mesodermal tissue.

Question 10: How do arthropods breathe?

- A) Gills

- B) Lungs

- C) Spiracles and tracheae

- D) Skin

Answer: C) Spiracles and tracheae

Explanation: Arthropods, like insects, use spiracles and a network of tracheae for gas exchange, allowing them to breathe air.

Question 11: Which vertebrate class includes frogs and toads?

- A) Pisces

- B) Amphibia

- C) Reptilia

- D) Aves

Answer: B) Amphibia

Explanation\* The class Amphibia includes animals like frogs and toads, which typically have a life cycle that involves both aquatic and terrestrial stages.

Question 12: What is one characteristic of mammals?

- A) Laying eggs

- B) Cold-blooded

- C) Hair or fur

- D) Gills

Answer: C) Hair or fur

Explanation: Mammals are characterized by the presence of hair or fur and mammary glands that produce milk for their young.

Question 13 How do sponges obtain food?

- A) Photosynthesis

- B) Absorption

- C) Filter feeding

- D) Predation

Answer: C) Filter feeding

Explanation: Sponges are filter feeders; they draw water through their porous bodies to capture food particles.

Question 1\* What is the primary economic importance of fungi?

- A) Providing oxygen

- B) Decomposing organic matter

- C) Causing diseases

- D) Producing chlorophyll

Answer: B) Decomposing organic matter

Explanation: Fungi play a crucial role in ecosystems as decomposers, breaking down organic matter and recycling nutrients.

Question 15: What type of reproduction is common in bacteria?

- A) Sexual reproduction

- B) Asexual reproduction

- C) Budding

- D) Fragmentation

Answer: B) Asexual reproduction

Explanation: Bacteria typically reproduce asexually through binary fission, where one cell divides into two identical cells.

Question 16: What is the main function of the contractile vacuole in protozoans like Amoeba?

- A) Digestion

- B) Excretion

- C) Movement

- D) Reproduction

Answer: B) Excretion

Explanation: The contractile vacuole helps remove excess water from the cell, thus aiding in excretion.

Question 17: Which group of plants is known for having vascular tissues?

- A) Thallophyta

- B) Bryophyta

- C) Pteridophyta

- D) Fungi

Answer: C) Pteridophyta

Explanation: Pteridophyta, such as ferns, have vascular tissues (xylem and phloem), allowing for efficient transport of water and nutrients.

Question 18: What is the primary method of locomotion for protozoans like Euglena?

- A) Cilia

- B) Flagella

- C) Pseudopodia

- D) Wings

Answer: B) Flagella

Explanation: Euglena uses a flagellum for locomotion, allowing it to swim through water.

Question 19\* How do angiosperms differ from gymnosperms?

- A) Seed structure

- B) Leaf shape

- C) Habitat

- D) Size

Answer: A) Seed structure

Explanation: Angiosperms produce seeds enclosed in fruits, while gymnosperms produce naked seeds, typically found in cones.

Question 20: What is the life cycle stage of ferns that is typically dominant?

- A) Sporophyte

- B) Gametophyte

- C) Zygote

- D) Seedling

Answer: A) Sporophyte

Explanation: The sporophyte stage is the dominant phase in the life cycle of ferns, producing spores for reproduction.

Question 21 What is a characteristic feature of coelenterates?

- A) Segmentation

- B) Radial symmetry

- C) Exoskeleton

- D) Lungs

Answer: B) Radial symmetry

Explanation: Coelenterates, such as jellyfish and corals, exhibit radial symmetry, allowing them to interact with heenvironment from multiple directions.

Question 22: How do insects contribute to the environment?

- A) Pollination

- B) Decomposition

-c) Soil aeration

- D) All of the above

Answer: D) All of the above

Explanation: Insects play several vital roles in ecosystems, including pollination, decomposition, and soil aeration.

Question 23: What is the primary economic importance of gymnosperms?

- A) Food crops

- B) Timber and paper production

- C) Medicinal use

- D) Ornamental plants

Answer: B) Timber and paper production

Explanation: Gymnosperms, such as conifers, are important sources of timber and paper products.

Question 24: What is the main difference between monocots and dicots?

- A) Number of seed leaves (cotyledons)

- B) Type of root system

- C) Leaf venation pattern

- D) All of the above

Answer: D) All of the above

Explanation: Monocots have one cotyledon, while dicots have two; they also differ in root systems and leaf venation patterns.

Question 25: Which of the following is a characteristic of amphibians?

- A) Scales

- B) Feathers

- C) Moist skin

- D) Fin

Answer: C) Moist skin

Explanation: Amphibians have moist skin that helps with respiration and is often a characteristic feature of this group.

Question 26: What is the role of chloroplasts in plant cells?

- A) Energy production

- B) Photosynthesis

- C) Cellular respiration

- D) Protein synthesis

Answer: B) Photosynthesis

Explanation: Chloroplasts contain chlorophyll and are responsible for capturing light energy to produce glucose through photosynthesis.

Question 27: Which stage of the life cycle is dominant in mosses?

- A) Sporophyte

- B) Gametophyte

- C) Zygote

- D) Spore

Answer: B) Gametophyte

Explanation: The gametophyte stage is the dominant phase in mosses, producing gametes for reproduction.

Question 28: What is the evolutionary significance of invertebrates?

- A) They are the first multicellular organisms.

- B) They represent the earliest forms of life on Earth.

- C) They provide insights into the evolution of vertebrates.

- D) All of the above.

Answer: D) All of the above.

Explanation: Invertebrates are significant for understanding the evolution of multicellular life and the origins of vertebrates.

Question 29: How do earthworms benefit the environment?

- A) They improve soil aeration.

- B) They decompose organic matter.

- C) They enhance soil fertility.

- D) All of the above.

Answer:D) All of the above.

Explanation: Earthworms contribute to soil health by aerating it, decomposing organic matter, and enriching it with nutrients.

Question 30: What is one way that amphibians transition from life in water to life on land?

- A) Developing lungs

- B) Growing feathers

- C) Forming scales

- D) Developing fins

Answer: A) Developing lungs

Explanation: Amphibians develop lungs as they mature, allowing them to breathe air and adapt to terrestrial life.

Question 31: What kind of symmetry do echinoderms exhibit?

- A) Bilateral symmetry

- B) Radial symmetry

- C) Asymmetry

- D) None of the above

Answer: B) Radial symmetry

Explanation: Echinoderms, such as starfish and sea urchins, exhibit radial symmetry, especially in their adult forms.

Question 32: Which group of organisms is primarily involved in decomposition?

- A) Plants

- B) Fungi

- C) Animals

- D) Bacteria

Answer: B) Fungi

Explanation: Fungi are key decomposers in ecosystems, breaking down dead organic matter and recycling nutrients.

Question 33: How do gymnosperms reproduce?

- A) Seeds

- B) Spores

- C) Flowers

- D) Budding

Answer: A) Seeds

Explanation: Gymnosperms reproduce through seeds that are not enclosed in ovaries, often found in cones.

Question 34\* What is the significance of the phylum Arthropoda?

- A) They are the most diverse group of animals.

- B) They have a closed circulatory system.

- C) They reproduce asexually.

- D) They have no exoskeleton.

Answer:A) They are the most diverse group of animals.

Explanation: Arthropods, including insects, arachnids, and crustaceans, represent the largest and most diverse animal phylum.

Question 35: What is the function of the gills in fish?

- A) Digestion

- B) Respiration

- C) Reproduction

- D) Circulation

Answer: B) Respiration

Explanation:Gills in fish are specialized for gas exchange, allowing them to breathe underwater by extracting oxygen from water.

Question 36: What role do monocots play in agriculture?

- A) They are primarily ornamental.

- B) They are major food crops.

- C) They are used for timber.

- D) They are primarily medicinal plants.

Answer:B) They are major food crops.

Explanation: Monocots, such as maize and rice, are significant agricultural crops that provide essential food sources.

Question 37: In what environment do most amphibians thrive?

- A) Desert

- B) Aquatic and terrestrial

- C) Arctic

- D) Tropical forests only

Answer: B) Aquatic and terrestrial

Explanation: Most amphibians have a life cycle that includes both aquatic (larval) and terrestrial (adult) stages.

Question 38: Which group of plants is characterized by seedless reproduction?

- A) Angiosperms

- B) Gymnosperms

- C) Pteridophytes

- D) Bryophytes

Answer: C) Pteridophytes

Explanation: Pteridophytes, such as ferns, reproduce using spores instead of seeds.

Questio39: What type of animal is considered a vertebrate?

- A) Earthworm

- B) Cockroach

- C) Shark

- D) Jellyfish

Answer: C) Shark

Explanation: Sharks are vertebrates, having a backbone, while the others listed are invertebrates.

Question 40: What is the significance of the evolutionary transition from water to land?

- A) It led to the development of lungs.

- B) It increased biodiversity.

- C) It allowed for new ecological niches.

- D) All of the above.

Answer: D) All of the above.

Explanation: The transition from water to land allowed for the development of lungs, increased biodiversity, and the occupation of new ecological niches.

Question 41: How do insects contribute to pollination?

- A) By feeding on nectar

- B) By transporting pollen

- C) By nesting in flowers

- D) All of the above

Answer: D) All of the above.

Explanation: Insects, particularly bees, play a crucial role in pollination by feeding on nectar and transferring pollen between flowers.

Question 42 What feature distinguishes vertebrates from invertebrates?

- A) Presence of exoskeleton

- B) Presence of a backbone

- C) Ability to fly

- D) Ability to live in water

Answer: B) Presence of a backbone

Explanation: Vertebrates have a backbone (vertebral column), while invertebrates do not.

Question 43: Which group includes organisms that can photosynthesize?

- A) Fungi

- B) Animalia

- C) Plantae

- D) Protista

Answer: C) Plantae

Explanation: Organisms in the Plantae kingdom, such as plants, contain chlorophyll and can photosynthesize.

Question 44: How do bryophytes differ from vascular plants?

- A) They have true roots.

- B) They reproduce using seeds.

- C) They lack vascular tissues.

- D) They are always aquatic.

Answer: C) They lack vascular tissues.

Explanation: Bryophytes, such as mosses, do not have vascular tissues, which limits their size and habitat compared to vascular plants.

Question 45: What type of symmetry do starfish exhibit?

- A) Bilateral symmetry

- B) Radial symmetry

- C) Asymmetry

- D) None of the above

Answer: B) Radial symmetry

Explanation: Starfish exhibit radial symmetry, allowing them to be evenly arranged around a central axis.

Question 46: What is the economic importance of fungi in food production?

- A) They are used in fermentation.

- B) They produce toxins.

- C) They are used as pesticides.

- D) They have no economic importance.

Answer: A) They are used in fermentation.

Explanation: Fungi, particularly yeast, are essential in fermentation processes for producing bread, beer, and wine.

Question 47: Which of the following is a feature of mammals?

- A) Gills for breathing

- B) Hard exoskeleton

- C) Mammary glands

- D) Fins for swimming

Answer: C) Mammary glands

Explanation: Mammals are characterized by the presence of mammary glands, which produce milk for their young.

Question 48: What is the primary mode of nutrition in protozoans like Paramecium?

- A) Photosynthesis

- B) Absorption

- C) Heterotrophic

- D) Chemosynthesis

Answer: C) Heterotrophic

Explanation: Protozoans like Paramecium are heterotrophic; they obtain their nutrients by consuming other organisms.

Question 49: How do gymnosperms and angiosperms differ in reproduction?

- A) Gymnosperms produce seeds, while angiosperms do not.

- B) Angiosperms produce seeds enclosed in fruits, while gymnosperms do not.

- C) Both reproduce using spores.

- D) Gymnosperms have flowers, while angiosperms do not.

Answer: B) Angiosperms produce seeds enclosed in fruits, while gymnosperms do not.

Explanation: This distinction is fundamental in understanding plant reproduction.

Question 50: What is the significance of studying evolutionary transitions among organisms?

- A) It helps understand biodiversity.

- B) It provides insights into environmental adaptations.

- C) It aids in conservation efforts.

- D) All of the above.

Answer: D) All of the above.

Explanation: Studying evolutionary transitions helps scientists understand biodiversity, adaptations to environments, and informs conservation strategies.

1. **Structural, Functional, and Behavioral Adaptations of Organisms**

Question 1: What is adaptive coloration?

- A) A type of camouflage

- B) A method of thermoregulation

-) A form of mmunication

- D) A means of locomotion

Answer: A) A type of camouflage

Explanation: Adaptive coloration refers to the ability of organisms to blend into their environment, which helps them avoid predation.

Question 2: How does countershading work in fish?

- A) It makes them more visible from above.

- B) It provides camouflage in both light and dark environments.

- C) It aids in thermoregulation.

- D) It attracts mates.

Answer: B) It provides camouflage in both light and dark environments.

Explanation: Countershading involves a darker color on the top and a lighter color on the bottom, helping fish blend into the water from both above and below.

Question 3: What is a behavioral adaptation of social animals?

- A) Camouflage

- B) Nest building

- C) Countershading

- D) Mimicry

Answer:B) Nest building

Explanation: Nest building is a behavioral adaptation that provides shelter and a safe environment for raising offspring.

Question 4: How do structural adaptations help organisms?

- A) By providing food

- B) By enhancing survival in their environment

- C) By increasing mobility

- D) By attracting mates

Answer: B) By enhancing survival in their environment

Explanation:Structural adaptations, such as body shape or coloration, improve an organism's ability to survive and reproduce in its habitat.

Question 5: what of these is an example of warning coloration?

- A) The green color of leaves

- B) The bright colors of poison dart frogs

- C) The dull color of a rock

- D) The camouflage of a chameleon

Answer: B) The bright colors of poison dart frogs

Explanation: Warning coloration (aposematism) signals to predators that an organism is toxic or unpalatable.

Question 6: How do different castes in social insects like termites function within their colony?

- A) They all have the same role.

- B) They perform specialized tasks.

- C) They do not contribute to the colony.

- D) They only reproduce.

Answer: B) They perform specialized tasks.

Explanation: In social insect colonies, different castes (e.g., workers, soldiers, and reproductives) have specific roles that contribute to the colony's survival.

Question 7: What is basking in lizards?

- A) A form of hibernation

- B) A method of thermoregulation

- C) A mating display

- D) A feeding behavior

Answer: B) A method of thermoregulation

Explanation: Basking allows lizards to absorb heat from the sun, helping them regulate their body temperature.

Question 8: What is the purpose of territorial behavior in animals?

- A) To find food

- B) To establish breeding grounds

- C) To reduce competition

- D) All of the above

Answer: D) All of the above

Explanation: Territorial behavior helps animals secure resources, establish breeding territories, and reduce competition with others.

Question 9: How do beaks of birds illustrate adaptation?

- A) They provide camouflage.

- B) They are used for communication.

- C) They are shaped according to their feeding habits.

- D) They help in thermoregulation.

Answer: C) They are shaped according to their feeding habits.

Explanation: Different bird species have evolved beak shapes that match their diet, such as long beaks for nectar-feeding or strong beaks for cracking seeds.

Question 10: What adaptation helps insects like mosquitoes feed?

- A) Strong legs

- B) Specialized mouthparts

- C) Bright coloration

- D) Camouflage

Answer: B) Specialized mouthparts

Explanation: Mosquitoes have elongated mouthparts (proboscis) adapted for piercing skin and sucking blood or nectar.

Question 11: How do spines in plants aid in survival?

- A) They provide decoration.

- B) They help with photosynthesis.

- C) They deter herbivores.

- D) They attract pollinators.

Answer C) They deter herbivores.

Explanation: Spines serve as a defense mechanism, making it difficult for herbivores to eat the plant.

Question 12: What is a structural adaptation of toads for protection?

- A) Bright colors

- B) Warty skin

- C) Long legs

- D) Loud calls

Answer: B) Warty skin

Explanation: The warty skin of toads contains toxins that deter predators, serving as a protective adaptation.

Question 13: How do hair and feathers help animals regulate body temperature?

- A) They provide camouflage.

- B) They retain heat.

- C) They attract mates.

- D) They aid in locomotion.

Answer: B) They retain heat.

Explanation: Hair and feathers trap air, providing insulation that helps maintain body temperature in rying environments.

Question 14: What is the purpose of male Agama lizards displaying their red heads?

- A) To scare predators

- B) To attract mates

- C) To establish territory

- D) To camouflage

Answer:B) To attract mates

Explanation: The bright coloration of male Agama lizards is a display trait used to attract females ring matg season.

Question 15: What is hibernation?

- A) A reproductive strategy

- B) A method of food storage

- C) A state of inactivity during cold conditions

- D) A form of migration

Answer: C) A state of inactivity during cold conditions

Explanation: Hibernation is a survival strategy used by some animals to conserve energy during periods of cold when food is scarce.

Question 16 What is aestivation?

- A) A form of migration

- B) A state of inactivity during hot conditions

- C) A reproductive strategy

- D) A method of food storage

Answer: B) A state of inactivity during hot conditions

Explanation: Aestivation is similar to hibernation but occurs during hot, dry periods to conserve moisture and energy.

Question 17: How do praying mantises protect themselves from predators?

- A) Bright colors

- B) Camouflage and mimicry

- C) Speed

- D) Loud noises

Answer: B) Camouflage and mimicry

Explanation: Praying mantises blend into their environments, making it difficult for predators to spot them.

Questioin 18 What is the primary function of mouthparts in butterflies?

- A) Defense

- B) Feeding on nectar

- C) Locomotion

- D) Communication

Answer:B) Feeding on nectar

Explanation: Butterflies have specialized mouthparts (proboscis) that allow them to sip nectar from flowers.

Question 19\* ow do scales in mammals help with water conservation?

- A) They provide camouflage.

- B) They reduce water loss through the skin.

- C) They aid in locomotion.

- D) They attract mates.

Answer: B) They reduce water loss through the skin.

Explanation: Scales help minimize water loss, making them crucial for survival in arid environments.

Question 20: What role does the exoskeleton play in arthropods?

- A) It aids in respiration.

- B) It provides structure and protection.

- C) It helps with locomotion.

- D) It regulates temperature.

Answer: B) It provides structure and protection.

Explanation: The exoskeleton serves as a protective barrier against predators and environmental hazards while supporting the body structure.

Question 21: How do social insects like termites exhibit behavioral adaptations?

- A) They migrate long distances.

- B) They live solitarily.

- C) They have complex social structures and roles.

- D) They do not communicate.

Answer: C) They have complex social structures and roles.

Explanation: Social insects like termites have established roles within their colonies, such as workers, soldiers, and reproductives, which enhances survival.

Question 22: How do camouflage adaptations benefit prey animals?

- A) They help them find food.

- B) They attract mates.

- C) They allow them to hide from predators.

- D) They help them find water.

Answer: C) They allow them to hide from predators.

Explanation: Camouflage helps prey animals blend into their environment, reducing the likelihood of being detected by predators.

Question 23: What is the benefit of having a strong beak in birds of prey?

- A) It helps them attract mates.

- B) It allows them to crack seeds.

- C) It aids in hunting and tearing flesh.

- D) It provides insulation.

Answer: C) It aids in hunting and tearing flesh.

Explanation: Birds of prey have strong, hooked beaks adapted for capturing and consuming their prey.

Question 24: Why are some insects brightly colored?

- A) To provide camouflage

- B) To attract predators

- C) To warn potential predators of toxicity

- D) To blend in with their environment

Answer: C) To warn potential predators of toxicity

Explanation: Bright coloration can serve as a warning (aposematism) that signals to predators that the insect is toxic or unpalatable.

Question 25: How do animals like polar bears adapt to cold environments?

- A) They migrate south.

- B) They develop bright colors.

- C) They have thick fur and a layer of fat.

- D) They reduce their food intake.

Answer: C) They have thick fur and a layer of fat.

Explanation: Polar bears have thick fur and a layer of blubber that insulates them against extreme cold.

Question 26: What adaptation do desert plants have for conserving water?

- A) Large leaves

- B) Shallow roots

- C) Spines instead of leaves

- D) Bright flowers

Answer: C) Spines instead of leaves

Explanation: many desert plants have spines to reduce water loss and provide shade, minimizing evaporation

Question 27 How do male birds use displays of feathers during mating?

- A) To intimidate competitors

- B) To camouflage

- C) To attract females

- D) To regulate temperature

Answer: C) To attract females

Explanation: Male birds often display bright feathers and intricate patterns to attract mates during mating rituals.

Question 28: What is the significance of social behavior in bees?

- A) They are solitary creatures.

- B) They have complex communication and division of labor.

- C) They do not reproduce.

- D) They only forage for themselves.

Answer: B) They have complex communication and division of labor.

Explanation: Social behavior in bees includes communication through dances and a division of labor among workers, queens, and drones.

Question 29: What type of adaptation is shown by stick insects?

- A) Bright coloration

- B) Camouflage to resemble twigs

- C) Rapid movement

- D) Loud calls

Answer: B) Camouflage to resemble twigs

Explanation: Stick insects have evolved to resemble twigs or branches, providing effective camouflage against predators.

Question 30: How do animals like frogs adapt to changes in temperature?

- A) They become dormant.

- B) They migrate.

- C) They change coloration.

- D) They build shelters.

Answer: A) They become dormant.

Explanation: Frogs can enter a state of dormancy (hibernation or aestivation) to survive extreme temperature changes.

Question 31: Which of the following adaptations helps birds regulate their body temperature?

- A) Scales

- B) Feathers

- C) Gills

- D) Shells

Answer: B) Feathers

Explanation: Feathers provide insulation and help birds maintain their body temperature in various environmental conditions.

Question 32 What is the primary function of the proboscis in butterflies?

- A) Defense

- B) Feeding

- C) Locomotion

- D) Reproduction

Answer: B) Feeding

Explanation: The proboscis is adapted for sucking nectar from flowers, allowing butterflies to feed efficiently.

Question 33: How do lizards use basking as an adaptation?

- A) To avoid predators

- B) To find food

- C) To absorb heat for thermoregulation

- D) To attract mates

Answer: C) To absorb heat for thermoregulation

Explanation: Basking allows lizards to absorb sunlight and regulate their body temperature.

Question 34: How do adaptation strategies differ between aquatic and terrestrial animals?

- A) Aquatic animals have more limbs.

- B) Terrestrial animals use camouflage more often.

- C) Aquatic animals have adaptations for buoyancy and respiration in water.

- D) Terrestrial animals need more colors.

Answer: C) Aquatic animals have adaptations for buoyancy and respiration in water.

Explanation: Aquatic adaptations include structures like gills and streamlined bodies, while terrestrial adaptations often focus on locomotion and temperature regulation.

Question 35: What is the role of pheromones in social insects?

- A) To attract mates

- B) To communicate with colony members

- C) To deter predators

- D) To find food

Answer: B) To communicate with colony members

Explanation: Pheromones are chemical signals used by social insects to communicate important information within the colony.

Question 36: What is a key adaptation of the praying mantis for hunting?

- A) Bright colors

- B) Long legs

- C) Camouflage and raptorial forelegs

- D) Strong wings

Answer: C) Camouflage and raptorial forelegs

Explanation: The praying mantis uses its camouflage to ambush prey and has specialized forelegs adapted for grabbing.

Question 37: How do some plants adapt to low-nutrient environments?

- A) By growing large leaves

- B) By developing deep roots

- C) By forming symbiotic relationships with fungi (mycorrhizae)

- D) By producing bright flowers

Answer: C) By forming symbiotic relationships with fungi (mycorrhizae)

Explanation: Mycorrhizal fungi help plants absorb nutrients from the soil, enhancing their growth in nutrient-poor conditions.

Question 38: What is the function of camouflage in predators?

- A) To scare off competitors

- B) To attract mates

- C) To stalk and ambush prey

- D) To regulate body temperature

Answer: C) To stalk and ambush prey

Explanation: Camouflage helps predators blend into their environment, making it easier to approach and capture prey.

Question 39: Which adaptation helps desert animals conserve water?

- A) Bright colors

- B) Nocturnal behavior

- C) Large body size

- D) Thick fur

Answer: B) Nocturnal behavior

Explanation: Many desert animals are nocturnal, being active at night to avoid the heat of the day and conserve water.

Question 40: How do feathers help birds in flight?

- A) They provide camouflage.

- B) They reduce weight and improve aerodynamics.

- C) They regulate body temperature.

- D) They attract mates.

Answer: B) They reduce weight and improve aerodynamics.

Explanation: Feathers are lightweight and structured to help birds achieve lift and maneuverability during flight.

Question 4\* How do social behaviors contribute to the success of ant colonies?

- A) They reduce competition among individuals.

- B) They allow for division of labor and efficient resource use.

- C) They promote solitary living.

- D) They decrease communication.

Answer: B) They allow for division of labor and efficient resource use.

Explanation: Social behaviors in ant colonies promote cooperation and specialization, enhancing their survival and efficiency.

Question 42: What is the significance of the thick skin in hippos?

- A) It aids in camouflage.

- B) It protects against UV radiation and dehydration.

- C) It helps in locomotion.

- D) It allows for better thermoregulation.

Answer: B) It protects against UV radiation and dehydration.

Explanation: Thick skin in hippos provides protection from the sun and helps retain moisture in their environment.

Question 43: How do animals like camels adapt to extreme heat?

- A) They have long legs.

- B) They store fat in their humps.

- C) They have bright colors.

- D) They are nocturnal.

Answer: B) They store fat in their humps.

Explanation: Camels store fat in their humps, which can be metabolized for energy and water, helping them survive in arid climates.

Question 44: What is an example of a structural adaptation in snakes?

- A) Camouflage patterns

- B) Strong limbs

- C) Bright colors

- D) Feathers

Answer: A) Camouflage patterns

Explanation: Many snakes have developed camouflage patterns that help them blend into their environments to avoid detection by predators and prey.

Question 45 How do social bees communicate the location of food sources?

- A) By changing colors

- B) By performing a waggle dance

- C) By emitting pheromones

- D) By making loud noises

Answer: B) By performing a waggle dance

Explanation: Bees perform a waggle dance to convey information about the direction and distance of food sources to other colony members.

Question 46: What type of adaptation do stick insects exhibit?

- A) Bright coloration

- B) Mimicry of twigs

- C) Strong wings

- D) Loud calls

Answer: B) Mimicry of twigs

Explanation: Stick insects mimic the appearance of twigs or branches, providing effective camouflage against predators.

Question 47: How do spines in cacti help the plant?

- A) They provide shade.

- B) They deter herbivores and reduce water loss.

- C) They attract pollinators.

- D) They improve photosynthesis.

Answer: B) They deter herbivores and reduce water loss.

Explanation: Spines serve as a defense mechanism against herbivores and help reduce water loss by minimizing surface area exposed to sunlight.

Question 48: What adaptation do birds use for regulating body temperature in cold weather?

- A) Bright plumage

- B) Thick feathers

- C) Long beaks

- D) Large wings

Answer: B) Thick feathers

Explanation: Thick feathers provide insulation, helping birds maintain their body temperature in cold conditions.

Question 49: How do animals like fish use countershading as an adaptation?

- A) To attract mates

- B) To blend in with their surroundings from both above and below

- C) To scare off predators

- D) To regulate temperature

Answer: B) To blend in with their surroundings from both above and below

Explanation: Countershading involves having a darker color on the top and a lighter color on the bottom, which helps fish camouflage themselves from predators and prey by blending into the water when viewed from different angles.

Here are 50 questions on the topic of "Form and Functions," focusing on the internal structures of plants and animals, along with detailed explanations:

**B:FormandFunctions**

1. **Internal structure of plants and animals**

Question 1: What is the primary function of roots in flowering plants?

- A) Photosynthesis

- B) Water and nutrient absorption

- C) Reproduction

- D) Support

Answer: B) Water and nutrient absorption

Explanation: Roots anchor the plant in the soil and are primarily responsible for absorbing water and essential nutrients from the ground.

Question 2: What type of tissue is collenchyma?

- A) Protective tissue

- B) Supportive tissue

- C) Conductive tissue

- D) Meristematic tissue

Answer: B) Supportive tissue

Explanation: Collenchyma provides flexible support to young and growing parts of plants due to its cell walls that are unevenly thickened.

Question 3: In a transverse section of a stem, which tissue is responsible for transport of nutrients and water?

- A) Phloem

- B) Xylem

- C) Cortex

- D) Pith

Answer: B) Xylem

Explanation: Xylem tissue transports water and dissolved minerals from the roots to the rest of the plant.

Question 4: What is the function of phloem in plants?

- A) Transport of water

- B) Transport of sugars and nutrients

- C) Structural support

- D) Photosynthesis

Answer: B) Transport of sugars and nutrients

Explanation: Phloem transports organic compounds, primarily sugars produced by photosynthesis, from leaves to other parts of the plant.

Question 5: How does the structure of leaves facilitate their function in photosynthesis?

- A) They have thick cuticles to retain water.

- B) They contain chloroplasts for capturing light energy.

- C) They are covered in spines to deter herbivores.

- D) They are rigid to support the plant.

Answer: B) They contain chloroplasts for capturing light energy.

Explanation: Chloroplasts in leaf cells contain chlorophyll, which captures light energy necessary for photosynthesis.

Question 6: What type of supporting tissue is sclerenchyma?

- A) Flexible supporting tissue

- B) Protective tissue

- C) Hard, rigid supporting tissue

- D) Conductive tissue

Answer: C) Hard, rigid supporting tissue

Explanation: Sclerenchyma provides structural support and strength to mature plant parts due to its thick, lignified cell walls.

Question 7: In a transverse section of a root, where would you find the xylem?

- A) At the outer edge

- B) In the center

- C) Between the cortex and phloem

- D) Just below the epidermis

Answer: B) In the center

Explanation: In most roots, the xylem is located centrally, surrounded by phloem, providing efficient transport of water and nutrients.

Question 8: Which part of the flower is primarily responsible for reproduction?

- A) Petals

- B) Sepals

- C) Stamen and pistil

- D) Leaves

Answer: C) Stamen and pistil

Explanation: The stamen (male) produces pollen, while the pistil (female) contains the ovary, facilitating reproduction in flowering plants.

Question 9: What is the primary role of the stem in flowering plants?

- A) Absorption of water

- B) Photosynthesis

- C) Transport of nutrients and support

- D) Storage of energy

Answer: C) Transport of nutrients and support

Explanation: The stem supports the plant and contains vascular tissues (xylem and phloem) that transport water, nutrients, and sugars.

Question 10: How can you identify supporting tissues in a plant?

- A) By their color under a microscope

- B) By their position in the plant

- C) By their cell wall structure

- D) By their size

Answer: C) By their cell wall structure

Explanation: Supporting tissues, like collenchyma and sclerenchyma, have distinctive thickened cell walls that provide strength and support.

Question 11: In mammals, which organ is primarily responsible for digestion?

- A) Liver

- B) Stomach

- C) Pancreas

- D) Intestines

Answer: B) Stomach

Explanation: The stomach plays a crucial role in breaking down food through mechanical and chemical processes during digestion.

Question 12:What type of tissue comprises the outer layer of a plant's roots?

- A) Parenchyma

- B) Epidermis

- C) Sclerenchyma

- D) Collenchyma

Answer: B) Epidermis

Explanation:The epidermis is the protective outer layer of roots that helps prevent water loss and protects against pathogens.

Question 13: What is the appearance of xylem in a transverse section?

- A) Thin-walled cells

- B) Large, empty cells

- C) Thick-walled, hollow vessels

- D) Compact, densely packed cells

Answer: C) Thick-walled, hollow vessels

Explanation: Xylem appears as thick-walled, hollow vessels in a transverse section, designed to transport water.

Question 14 Which organ in mammals filters blood and produces urine?

- A) Liver

- B) Kidneys

- C) Bladder

- D) Pancreas

Answer: B) Kidneys

Explanation: The kidneys filter waste products from the blood and produce urine for excretion.

Question 15: What is the primary function of the leaf's stomata?

- A) Support the leaf structure

- B) Photosynthesis

- C) Gas exchange

- D) Water storage

Answer: C) Gas exchange

Explanation: Stomata are small openings on the leaf surface that allow for the exchange of gases (CO₂ and O₂) during photosynthesis and respiration.

Question 16: How are supporting tissues arranged in stems?

- A) Randomly distributed

- B) In a ring formation

- C) Only in the center

- D) Only on the surface

Answer: B) In a ring formation

Explanation: In many stems, xylem and phloem are arranged in a ring formation, allowing efficient transport and support.

Question 17: What type of tissue connects different parts of the plant?

- A) Ground tissue

- B) Vascular tissue

- C) Dermal tissue

- D) Meristematic tissue

Answer: B) Vascular tissue

Explanation: Vascular tissue, composed of xylem and phloem, connects roots, stems, and leaves, facilitating transport of water and nutrients.

Question 18: What is the position of the heart in the mammalian body?

- A) In the abdominal cavity

- B) In the thoracic cavity, between the lungs

- C) In the pelvic cavity

- D) In the cranial cavity

Answer: B) In the thoracic cavity, between the lungs

Explanation: The heart is located in the thoracic cavity, specifically in the mediastinum, between the lungs.

Question 19: What is the arrangement of the digestive organs in mammals?

- A) Randomly arranged

- B) In a linear sequence

- C) Circular formation

- D) Clustered together

Answer: B) In a linear sequence

Explanation: Digestive organs in mammals are arranged in a linear sequence, from the oral cavity to the anus, allowing for the orderly processing of food.

Question 20:How do leaves adapt for maximum light absorption?

- A) By being thick and leathery

- B) By having a broad, flat surface

- C) By rolling up during the day

- D) By changing colors

Answer:B) By having a broad, flat surface

Explanation: The broad, flat surface of leaves increases the area available for light absorption, optimizing photosynthesis.

Question 21: What is the appearance of phloem in a transverse section?

- A) Hollow tubes

- B) Thick-walled cells

- C) Small, densely packed cells

- D) Long, sieve-like structures

Answer: D) Long, sieve-like structures

Explanation: Phloem appears as long, sieve-like structures in transverse sections, which facilitate the transport of sugars.

Question 22: How does the structure of the small intestine aid in digestion?

- A) It is very short.

- B) It has a large surface area due to villi and microvilli.

- C) It is muscular for rapid movement.

- D) It has thick walls.

Answer: B) It has a large surface area due to villi and microvilli.

Explanation: The presence of villi and microvilli increases the surface area of the small intestine, enhancing nutrient absorption.

Question 23: What supporting tissue is primarily responsible for providing strength in mature woody plants?

- A) Collenchyma

- B) Parenchyma

- C) Sclerenchyma

- D) Phloem

Answer: C) Sclerenchyma

Explanation: Sclerenchyma tissue provides structural support and strength due to its thick, lignified cell walls.

Question 24: What is the primary role of the liver in mammals?

- A) Digestion

- B) Filtration

- C) Detoxification and metabolism

- D) Respiration

Answer: C) Detoxification and metabolism

Explanation: The liver plays a crucial role in detoxifying harmful substances and metabolizing nutrients from the digestive tract.

Question 25: What type of plant tissue is primarily responsible for photosynthesis?

- A) Xylem

- B) Phloem

- C) Parenchyma

- D) Sclerenchyma

Answer: C) Parenchyma

Explanation: Parenchyma tissue in leaves contains chloroplasts and is primarily responsible for photosynthesis.

Question 26 How do roots adapt to enhance nutrient absorption?

- A) By being long and thick

- B) By having a large surface area due to root hairs

- C) By growing deep into the ground

- D) By being covered in bark

Answer: B) By having a large surface area due to root hairs

Explanation: Root hairs increase the surface area for absorption, allowing for more efficient uptake of water and nutrients.

Question 27: What is the function of the bladder in mammals?

- A) To store urine

- B) To digest food

- C) To filter blood

- D) To produce hormones

Answer: A) To store urine

Explanation:The bladder stores urine until it is excreted from the body.

Question 28: Which organ is primarily responsible for gas exchange in mammals?

- A) Stomach

- B) Lungs

- C) Kidneys

- D) Heart

Answer: B) Lungs

Explanation: The lungs facilitate the exchange of oxygen and carbon dioxide between the air and the bloodstream.

Question 29: In a flowering plant, what part is primarily involved in attracting pollinators?

- A) Roots

- B) Leaves

- C) Flowers

- D) Stems

Answer: C) Flowers

Explanation: Flowers are specialized structures that attract pollinators through their color, scent, and nectar.

Question 30 What is the main function of the circulatory system in mammals?

- A) Digestion of food

- B) Transport of nutrients and gases

- C) Production of hormones

- D) Regulation of temperature

Answer: B) Transport of nutrients and gases

Explanation: The circulatory system transports oxygen, carbon dioxide, nutrients, and waste products throughout the body.

Question 31: How do mammalian kidneys maintain homeostasis?

- A) By producing hormones

- B) By filtering blood and regulating water balance

- C) By digesting food

- D) By generating heat

Answer: B) By filtering blood and regulating water balance

Explanation: Kidneys filter blood to remove waste products and regulate the body's water and electrolyte balance.

Question 32: What is the primary role of the epidermis in plant leaves?

- A) Photosynthesis

- B) Protection and reducing water loss

- C) Nutrient transport

- D) Support

Answer: B) Protection and reducing water loss

Explanation: The epidermis acts as a protective layer that helps prevent water loss through its cuticle.

Question 33: How are roots structured to anchor plants in the soil?

- A) By being thick and short

- B) By growing deep and spreading widely

- C) By having spines

- D) By being flexible

Answer B) By growing deep and spreading widely

Explanation: Roots are adapted to anchor plants securely in the soil, providing stability and access to nutrients.

Question 34: What is the primary function of the pancreas in mammals?

- A) Gas exchange

- B) Hormone production and digestion

- C) Nutrient absorption

- D) Waste excretion

Answer: B) Hormone production and digestion

Explanation: The pancreas produces digestive enzymes and hormones, including insulin, which regulates blood sugar levels.

Question 35: What is the significance of the large surface area in alveoli?

- A) It aids in water absorption.

- B) It allows for efficient gas exchange.

- C) It provides structural support.

- D) It prevents infection.

Answer: B) It allows for efficient gas exchange.

Explanation: The large surface area of alveoli increases the efficiency of oxygen and carbon dioxide exchange in the lungs.

Question 36: How do mammalian hearts adapt to their function?

- A) They are small and compact.

- B) They have four chambers for efficient blood circulation.

- C) They have thick walls to prevent blood loss.

- D) They are located in the abdomen.

Answer: B) They have four chambers for efficient blood circulation.

Explanation: The four-chambered heart allows for the separation of oxygenated and deoxygenated blood, improving circulation efficiency.

Question 37: What type of tissue is responsible for photosynthesis in plants?

- A) Vascular tissue

- B) Ground tissue (parenchyma)

- C) Dermal tissue

- D) Meristematic tissue

Answer: B) Ground tissue (parenchyma)

Explanation: Parenchyma tissue in leaves contains chloroplasts and is responsible for photosynthesis.

Question 38: How do the reproductive organs in mammals typically appear?

- A) Small and hidden

- B) Well-defined and organized

- C) Randomly distributed

- D) Non-functional

Answer: B) Well-defined and organized

Explanation: Mammalian reproductive organs are typically well-defined and organized for their specific functions in reproduction.

Question 39: What is the main function of the small intestine in mammals?

- A) Absorption of nutrients

- B) Storage of waste

- C) Digestion of fats

- D) Filtration of blood

Answer:A) Absorption of nutrients

Explanation: The small intestine is primarily responsible for the absorption of nutrients from digested food.

Question 40: How does the presence of vascular bundles benefit plants?

- A) It allows for photosynthesis.

- B) It enables efficient transport of water and nutrients.

- C) It provides structural support.

- D) It aids in reproduction.

Answer: B) It enables efficient transport of water and nutrients.

Explanation: Vascular bundles (xylem and phloem) facilitate the movement of water, minerals, and sugars throughout the plant.

Question 41: What is the role of the large intestine in mammals?

- A) Digestion of food

- B) Absorption of water and electrolytes

- C) Production of bile

- D) Filtration of blood

Answer: B) Absorption of water and electrolytes

Explanation: The large intestine absorbs water and electrolytes from indigestible food matter, forming waste for excretion.

Question 42 How do the structures of leaves maximize photosynthesis?

- A) They are thick and leathery.

- B) They have a waxy cuticle.

- C) They contain numerous chloroplasts.

- D) They are small and compact.

Answer: C) They contain numerous chloroplasts.

Explanation: The presence of numerous chloroplasts in leaf cells maximizes the surface area for capturing light energy for photosynthesis.

Question 43: What is the primary function of the spleen in mammals?

- A) Digestion

- B) Blood filtration and immune response

- C) Hormone production

- D) Nutrient absorption

Answer: B) Blood filtration and immune response

Explanation: The spleen filters blood, removes old red blood cells, and plays a role in immune responses.

Question 44: How do plant roots adapt to low oxygen conditions in waterlogged soils?

- A) By developing aerenchyma

- B) By growing deeper

- C) By producing fewer roots

- D) By increasing leaf size

Answer: A) By developing aerenchyma

Explanation: Aerenchyma are specialized tissues that allow for gas exchange and buoyancy, helping roots survive in low-oxygen conditions.

Question 45 What is the role of the gallbladder in mammals?

- A) Storage of bile

- B) Production of digestive enzymes

- C) Regulation of blood sugar

- D) Filtration of waste

Answer: A) Storage of bile

Explanation: The gallbladder stores and concentrates bile, which is used to emulsify fats during digestion.

Question 46: How does the structure of the stomach aid in digestion?

- A) It has a smooth surface.

- B) It is muscular and lined with gastric glands.

- C) It connects directly to the intestines.

- D) It has a large surface area.

Answer: B) It is muscular and lined with gastric glands.

Explanation: The muscular walls of the stomach help mix food, and gastric glands secrete digestive enzymes and acids to break down food.

Question 47: What type of tissue provides the primary support in herbaceous plants?

- A) Sclerenchyma

- B) Collenchyma

- C) Parenchyma

- D) Xylem

Answer: B) Collenchyma

Explanation: Collenchyma provides flexible support in young, growing parts of herbaceous plants.

Question 48: How do the kidneys contribute to homeostasis in mammals?

- A) By regulating blood pressure

- B) By filtering waste and balancing electrolytes

- C) By producing hormones

- D) By aiding in digestion

Answer: B) By filtering waste and balancing electrolytes

Explanation: Kidneys filter blood to remove waste products and regulate electrolyte and fluid balance, maintaining homeostasis.

Question 49: What is the function of the esophagus in mammals?

A) Digestion of carbohydrates

B) Transport of food from the mouth to the stomach

C) Absorption of nutrients

D) Production of digestive enzymes

Answer: B) Transport of food from the mouth to the stomach

Explanation: The esophagus is a muscular tube that connects the mouth to the stomach, facilitating the movement of food through peristaltic contractions. It does not participate in digestion; instead, its primary role is to transport swallowed food.

Here are 50 questions on the topic of "Nutrition," focusing on modes of nutrition, types of food substances, and related processes, along with detailed explanations:

1. **Nutrition**

Question 1: What is the main difference between autotrophic and heterotrophic modes of nutrition?

- A) Autotrophs require other organisms for food.

- B) Heterotrophs can produce their own food.

- C) Autotrophs can synthesize organic compounds from inorganic sources.

- D) Heterotrophs involve photosynthesis.

Answer: C) Autotrophs can synthesize organic compounds from inorganic sources.

Explanation: Autotrophs, such as plants, produce their own food using sunlight or chemical energy, while heterotrophs rely on consuming other organisms for energy.

Question 2: Which of the following is an example of an autotrophic organism?

- A) Sheep

- B) Tapeworm

- C) Sundew plant

- D) Rhizopus

Answer: C) Sundew plant

Explanation: Sundew is a carnivorous plant that uses photosynthesis to produce its own food, making ian autotroph

Question 3: What is the process of photosynthesis primarily used for?

- A) Energy production in animals

- B) Synthesis of organic compounds from CO₂ and water

- C) Breakdown of food

- D) Absorption of nutrients

Answer: B) Synthesis of organic compounds from CO₂ and water

Explanation: Photosynthesis converts light energy into chemical energy by synthesizing glucose from carbon dioxide and water.

Question 4: What is chemosynthesis?

- A) The process by which plants use sunlight

- B) The synthesis of organic compounds using chemical energy from inorganic substances

- C) The digestion of food

- D) The absorption of nutrients

Answer: B) The synthesis of organic compounds using chemical energy from inorganic substances

Explanation: Chemosynthesis is carried out by certain bacteria that convert inorganic compounds into organic matter using energy from chemical reactions.

Question 5: Which of the following nutrients is considered a macronutrient for plants?

- A) Iron

- B) Nitrogen

- C) Manganese

- D) Copper

Answer:\*B) Nitrogen

Explanation: Macronutrients are required in larger amounts for plant growth, and nitrogen is essential for producing proteins and nucleic acids.

Question 6: What is the role of carbohydrates in animal nutrition?

- A) Energy storage

- B) Structural support

- C) Transport of oxygen

- D) Hormone production

Answer: A) Energy storage

Explanation:Carbohydrates provide energy for metabolic processes and can be stored as glycogen in animals.

Question 7: What are essential fatty acids?

- A) Fats that can be synthesized by the body

- B) Fats that must be obtained through diet

- C) Fats that are harmful to health

- D) Fats that are produced by plants

Answer: B) Fats that must be obtained through diet

Explanation: Essential fatty acids are those that the body cannot synthesize and must be acquired from food.

Question 8: What test would you use to detect the presence of starch in a leaf?

- A) Benedict's test

- B) Iodine test

- C) Biuret test

- D) Sudan III test

Answer: B) Iodine test

Explanation: The iodine test turns blue-black in the presence of starch, indicating its presence in the leaf.

Question 9: Which of the following nutrients are classified as micronutrients?

- A) Carbohydrates

- B) Proteins

- C) Vitamins

- D) Fats

Answer: C) Vitamins

Explanation: Micronutrients, such as vitamins and minerals, are required in smaller amounts but are essential for various bodily functions.

Question 10: What type of nutrition do roundworms and tapeworms exhibit?

- A) Autotrophic

- B) Holozoic

- C) Parasitic

- D) Saprophytic

Answer: C) Parasitic

Explanation: Roundworms and tapeworms absorb nutrients from their host, exhibiting parasitic nutrition.

Question 11: How do saprophytic organisms obtain their nutrients?

- A) By consuming living hosts

- B) By decomposing dead organic matter

- C) By photosynthesis

- D) By absorbing nutrients from the soil

Answer: B) By decomposing dead organic matter

Explanation: Saprophytes, such as mushrooms and Rhizopus, feed on dead or decaying organic matter, recycling nutrients back into the ecosystem.

Question 12: What is the primary function of vitamins in the diet?

- A) Provide energy

- B) Build tissues

- C) Regulate metabolic processes

- D) Store fats

Answer: C) Regulate metabolic processes

Explanation: Vitamins play crucial roles in various biochemical reactions and help regulate metabolism.

Question 13 What are the light-dependent reactions of photosynthesis?

- A) Reactions that occur in the dark

- B) Reactions that convert light energy into chemical energy

- C) Reactions that synthesize glucose

- D) Reactions that absorb carbon dioxide

Answer: B) Reactions that convert light energy into chemical energy

Explanation: Light-dependent reactions occur in the thylakoid membranes of chloroplasts, converting light energy into ATP and NADPH.

Question 14: What is the importance of chlorophyll in photosynthesis?

- A) It absorbs light energy.

- B) It stores energy.

- C) It transports nutrients.

- D) It regulates temperature.

Answer:A) It absorbs light energy.

Explanation: Chlorophyll captures light energy from the sun, which is essential for the photosynthetic process.

Question 15: What are the main products of photosynthesis?

- A) Carbon dioxide and water

- B) Glucose and oxygen

- C) ATP and NADPH

- D) Starch and proteins

Answer: B) Glucose and oxygen

Explanation: The main products of photosynthesis are glucose, which provides energy, and oxygen, which is released as a byproduct.

Question 16: What happens during the assimilation of digested food?

- A) Food is broken down into smaller molecules.

- B) Nutrients are converted into body tissues.

- C) Waste products are excreted.

- D) Food is absorbed into the bloodstream.

Answer: B) Nutrients are converted into body tissues.

Explanation: Assimilation involves the incorporation of nutrients into body cells and tissues for growth and repair.

Question 17: What is the role of dental formulae in mammals?

- A) To indicate age

- B) To describe the types and number of teeth

- C) To classify species

- D) To assess health

Answer: B) To describe the types and number of teeth

Explanation: Dental formulae provide a standardized way to represent the number and types of teeth in different species, aiding in classification and comparison.

Question 18: How do mammalian teeth differ in structure and function?

- A) All teeth are the same.

- B) Different types of teeth are adapted for specific functions (e.g., cutting, grinding).

- C) Teeth are only for decoration.

- D) Teeth do not aid in digestion.

Answer: B) Different types of teeth are adapted for specific functions (e.g., cutting, grinding).

Explanation: Mammalian teeth vary in structure (incisors, canines, molars) to perform different roles in the mechanical digestion of food.

Question 19: What is the primary role of the liver in digestion?

- A) Absorb nutrients

- B) Produce bile for fat emulsification

- C) Break down carbohydrates

- D) Filter blood

Answer: B) Produce bile for fat emulsification

Explanation: The liver produces bile, which aids in the digestion and absorption of fats in the small intestine.

Question 20: What is the function of digestive enzymes?

- A) To absorb nutrients

- B) To break down food into smaller molecules

- C) To transport food

- D) To store energy

Answer: B) To break down food into smaller molecules

Explanation: Digestive enzymes catalyze the breakdown of complex food molecules into simpler forms that can be absorbed by the body.

Question 21: How are carbohydrates digested in mammals?

- A) They are absorbed as starch.

- B) They are broken down into glucose.

- C) They are stored in the liver.

- D) They are converted into proteins.

Answer: B) They are broken down into glucose.

Explanation: Carbohydrates are enzymatically digested into simpler sugars, primarily glucose, for absorption and energy use.

Question 22: What is the importance of a balanced diet?

- A) It prevents overeating.

- B) It ensures adequate nutrient intake for health.

- C) It promotes weight gain.

- D) It simplifies meal preparation.

Answer: B) It ensures adequate nutrient intake for health.

Explanation: A balanced diet provides all necessary nutrients in the right proportions for optimal health and functioning of the body.

Question 23 What deficiency disease is caused by a lack of vitamin C?

- A) Rickets

- B) Scurvy

- C) Pellagra

- D) Beriberi

Answer:B) Scurvy

Explanation: Scurvy is caused by a deficiency of vitamin C, leading to symptoms such as bleeding gums and fatigue.

Question 24: What is the primary function of the pancreas in relation to digestion?

- A) To produce bile

- B) To secrete digestive enzymes into the small intestine

- C) To filter blood

- D) To store food

Answer: B) To secrete digestive enzymes into the small intestine

Explanation: The pancreas produces and releases digestive enzymes that help break down carbohydrates, proteins, and fats in the small intestine.

Question 25: What role does water play in nutrition?

- A) It provides energy.

- B) It helps regulate body temperature and transport nutrients.

- C) It is not important.

- D) It aids in digestion only.

Answer: B) It helps regulate body temperature and transport nutrients.

Explanation: Water is essential for maintaining body temperature, transporting nutrients, and facilitating various metabolic processes.

Question 26 How do plants obtain nitrogen?

- A) Through photosynthesis

- B) From soil microorganisms

- C) From air directly

- D) By consuming other organisms

Answer: B) From soil microorganisms

Explanation: Plants often rely on symbiotic relationships with nitrogen-fixing bacteria in the soil to obtain nitrogen in a usable form.

Question 27: What is the significance of the dark reactions in photosynthesis?

- A) They occur only at night.

- B) They produce glucose using ATP and NADPH.

- C) They require sunlight directly.

- D) They release oxygen.

Answer: B) They produce glucose using ATP and NADPH.

Explanation: The dark reactions (Calvin cycle) utilize ATP and NADPH produced in the light reactions to synthesize glucose from carbon dioxide.

Question 28 What are the signs of potassium deficiency in plants?

- A) Yellowing of leaves

- B) Stunted growth

- C) Poor fruit development

- D) All of the above

Answer: D) All of the above

Explanation: Potassium deficiency can lead to various symptoms, including yellowing of leaves, stunted growth, and poor fruit quality.

Question 29: What is the primary source of energy for most living organisms?

- A) Fats

- B) Carbohydrates

- C) Proteins

- D) Vitamins

Answer: B) Carbohydrates

Explanation: carbohydrates are the primary source of energy for most organisms, providing readily available energy for metabolic processes.

Question 30: What is the primary role of vitamins in human nutrition?

- A) Provide energy

- B) Facilitate metabolic processes and maintain health

- C) Build body structures

- D) Regulate temperature

Answer: B) Facilitate metabolic processes and maintain health

Explanation: Vitamins play crucial roles as coenzymes and antioxidants, supporting various metabolic functions in the body.

Question 31 What is the role of the gallbladder in digestion?

- A) Producing digestive enzymes

- B) Storing bile for fat digestion

- C) Absorbing nutrients

- D) Filtering blood

Answer: B) Storing bile for fat digestion

Explanation: The gallbladder stores bile produced by the liver, releasing it into the small intestine to aid in fat digestion.

Question 32: What is the structure of a typical mammalian tooth?

-) Hollow with roots

- B) Composed of enamel, dentin, and pulp

- C) Made entirely of bone

- D) Soft and flexible

Answer: B) Composed of enamel, dentin, and pulp

Explanation: A typical mammalian tooth has hard enamel on the outside, dentin beneath it, and a central pulp cavity containing nerves and blood vessels.

Question 33:How do enzymes aid in digestion?

- A) By breaking down food into smaller molecules

- B) By absorbing nutrients

- C) By transporting food

- D) By storing energy

Answer:A) By breaking down food into smaller molecules

Explanation: Enzymes catalyze the hydrolysis of complex food molecules into simpler forms that can be absorbed by the body.

Question 34: What is the end product of protein digestion?

- A) Glucose

- B) Fatty acids

- C) Amino acids

- D) Glycerol

Answer: C) Amino acids

Explanation: Proteins are broken down into amino acids during digestion, which can be used for rious body functions, including protein synthesis

Question 35: What is the function of the small intestine in the digestive process?

- A) Storage of food

- B) Absorption of nutrients

- C) Mechanical breakdown of food

- D) Production of bile

Answer: B) Absorption of nutrients

Explanation: The small intestine is the primary site for the absorption of nutrients and water from digested food.

Question 36 How do you test for reducing sugars in food?

- A) Iodine lution

- B) Biuret reagent

- C) Benedict's solution

- D) Sudan III

Answer: C) Benedict's solution

Explanation: Benedict's solution is used to test for reducing sugars, which change color upon heating in the presence of these sugars.

Question 37 What is a characteristic symptom of vitamin D deficiency?

- A) Scurvy

- B) Rickets

- C) Pellagra

- D) Beriberi

Answer: B) Rickets

Explanation: Vitamin D deficiency leads to rickets, characterized by weak or soft bones in children.

Question 38: What type of nutrition do holozoic organisms exhibit?

- A) Absorption of nutrients

- B) Ingestion and digestion of food

- C) Photosynthesis

- D) Chemosynthesis

Answer: B) Ingestion and digestion of food

Explanation: Holozoic nutrition involves the ingestion, digestion, and assimilation of solid organic food.

Question 39: Which organ is primarily responsible for nutrient absorption in mammals?

- A) Stomach

- B) Large intestine

- C) Small intestine

- D) Liver

Answer: C) Small intestine

Explanation: The small intestine has a large surface area with villi that facilitate the absorption of nutrients into the bloodstream.

Question 40 What is the function of the liver in metabolism?

- A) Storage of bile

- B) Regulation of blood glucose levels

- C) Absorption of nutrients

- D) Production of digestive enzymes

Answer: B) Regulation of blood glucose levels

Explanation: The liver regulates blood glucose levels by converting excess glucose into glycogen for storage or breaking down glycogen back to glucose when needed.

Question 41: How do plants absorb water and minerals from the soil?

- A) Through leaves

- B) Through roots

- C) Through stems

- D) Through flowers

Answer: B) Through roots

Explanation: Roots absorb water and dissolved minerals from the soil, which are essential for plant growth and metabolic processes.

Question 42: What is the role of cellulose in plant nutrition?

- A) Energy source

- B) Structural support

- C) Nutrient absorption

- D) Photosynthesis

Answer: B) Structural support

Explanation: Cellulose is a complex carbohydrate that provides structural support to plant cells and tissues.

Question 43: What type of diet do carnivorous plants, like sundew, follow?

- A) Autotrophic

- B) Holozoic

- C) Parasitic

- D) Saprophytic

Answer: B) Holozoic

Explanation: Carnivorous plants obtain nutrients from capturing and digesting insects, following a holozoic mode of nutrition.

Question 44: What are the consequences of a vitamin A deficiency?

- A) Poor bone health

- B) Night blindness

- C) Fatigue

- D) Muscle weakness

Answer: B) Night blindness

Explanation: Vitamin A deficiency can lead to night blindness, as it is essential for the formation of rhodopsin in the retina.

Question 45: How does the structure of the mammalian alimentary canal facilitate digestion?

- A) It has a single, straight pathway.

- B) It is coiled and segmented to increase surface area.

- C) It has multiple openings.

- D) It is composed entirely of muscle.

Answer: B) It is coiled and segmented to increase surface area.

Explanation: The coiling and segmentation of the alimentary canal increase the surface area for digestion and absorption.

Question 46 How do enzymes like amylase function in digestion?

- A) They absorb nutrients.

- B) They catalyze the breakdown of starch into sugars.

C) They transrt food.

- D) They store energy.

Answer: They catalyze the breakdown of starch into sugars.

Explanation: Amylase is a digestive enzyme that hydrolyzes starch into simple sugars, facilitating carbohydrate digestion

Question 47: What is the primary function of the large intestine?

- A) Absorption of nutrients

- B) Absorption of water and formation of feces

- C) Digestion of proteins

- D) Regulation of blood sugar

Answer: B) Absorption of water and formation of feces

Explanation:The large intestine absorbs water from indigestible food matter and compacts it into feces for excretion.

Question 48:How do nutrient deficiencies manifest in plants?

- A) Increased growth

- B) Changes in leaf color and shape

- C) Improved photosynthesis

- D) Enhanced fruit production

Answer: B) Changes in leaf color and shape

1. **Transport**

1. What is the primary function of the circulatory system in mammals?

A) Digestion

B) Transportation of materials

C) Respiration

D) Excretion

Correct Answer: B) Transportation of materials

Explanation: The circulatory system is primarily responsible for transporting nutrients, gases, hormones, and waste products throughout the body.

---

2. Which of the following structures is responsible for transporting oxygenated blood away from the heart?

A) Veins

B) Capillaries

C) Arteries

D) Lymph vessels

Correct Answer: C) Arteries

Explanation: Arteries carry oxygenated blood away from the heart to the tissues.

---

3. What is the role of phloem in plants?

A) Transports water

B) Transports nutrients

C) Transports sugars and organic compounds

D) Provides structural support

Correct Answer: C) Transports sugars and organic compounds

Explanation: Phloem is responsible for transporting the products of photosynthesis (mainly sugars) from the leaves to other parts of the plant

---

4. Which component of blood is primarily responsible for transporting oxygen?

A) Plasma

B) White blood cells

C) Red blood cells

D) Platelets

Correct Answer: C) Red blood cells

Explanation: Red blood cells contain hemoglobin, which binds to oxygen and facilitates its transport throughout the body.

---

5. What does the hepatic portal vein do?

A) Transports oxygenated blood to the liver

B) Transports nutrient-rich blood from the intestines to the liver

C) Transports deoxygenated blood to the heart

D) Transports blood from the lungs to the heart

Correct Answer: B) Transports nutrient-rich blood from the intestines to the liver

Explanation: The hepatic portal vein carries blood from the gastrointestinal tract to the liver, allowing for nutrient processing.

---

6. Which process involves the movement of water across a semi-permeable membrane?

A) Diffusion

B) Osmosis

C) Active transport

D) Filtration

Correct Answer: B) Osmosis

Explanation:Osmosis specifically refers to the movement of water molecules across a semi-permeable membrane from an area of lower solute concentration to higher solute concentration.

---

7. In plants, what is the primary function of xylem?

A) Transport sugars

B) Transport water and minerals

C) Store nutrients

D) Provide structural support

Correct Answer:) Transport water and minerals

Explanation: Xylem is responsible for conducting water and dissolved minerals from the roots to the rest of the plant.

---

8. Which of the following is NOT a component of blood?

A) Plasma

B) Hemoglobin

C) Bile

D) Red blood cells

Correct Answer: C) Bile

Explanation: Bile is a digestive fluid produced by the liver and is not a component of blood.

---

9. What mechanism allows for the exchange of gases in capillaries?

A) Active transport

B) Diffusion

C) Osmosis

D) Filtration

Correct Answer: B) Diffusion

Explanation: Gases like oxygen and carbon dioxide move across capillary walls through diffusion from areas of higher concentration to lower concentration.

---

10. Which of the following describes root pressure?

A) Pressure created by the heart

B) Pressure that helps push water up from the roots

C) Pressure caused by transpiration

D) Pressure in the veins

Correct Answer: B) Pressure that helps push water up from the root\*

Explanation: Root pressure is created by the osmotic movement of water into the roots, helping to push water upward through the xylem.

---

11. What fluid is primarily responsible for transporting nutrients and waste in the body?

A) Lymph

B) Blood

C) Cytoplasm

D) Interstitial fluid

Correct Answer: B) Blood

Explanation: Blood is the primary fluid that transports nutrients, gases, hormones, and waste products throughout the body.

---

12. What is the primary role of lymph in the body?

A) Oxygen transport

B) Nutrient transport

C) Immune response

D) Temperature regulation

Correct Answer: C) Immune response

Explanation: Lymph plays a crucial role in the immune system by transporting white blood cells and filtering out pathogens.

---

13. Which type of circulatory system is characterized by blood flowing freely in body cavities?

A) Closed circulatory system

B) Open circulatory system

C) Double circulatory system

D) Single circulatory system

Correct Answer: B) Open circulatory system

Explanation: In an open circulatory system, blood is not confined to vessels and flows through cavities, allowing it to come into direct contact with tissues.

---

14. Which process is primarily responsible for the movement of water vapor from leaves to the atmosphere?

A) Transpiration

B) Evaporation

C) Diffusion

D) Filtration

Correct Answer: A) Transpiration

Explanation: Transpiration is the process by which water vapor is released from the stomata of leaves into the atmosphere.

---

15. Which of the following is a characteristic of active transport?

A) Requires energy

B) Moves substances down their concentration gradient

C) Is a passive process

D) Occurs only in plants

Correct Answer: A) Requires energy

Explanation: Active transport requires energy (usually from ATP) to move substances against their concentration gradient.

---

16. How does turgidity benefit plant cells?

A) Provides flexibility

B) Prevents wilting

C) Aids in photosynthesis

D) Facilitates reproduction

Correct Answer: B) Prevents wilting

Explanation: Turgidity helps maintain cell structure and prevents wilting by keeping cells firm and swollen with water.

---

17. What is the main role of capillaries in the circulatory system?

A) Transport blood away from the heart

B) Exchange substances between blood and tissues

C) Return blood to the heart

D) Produce red blood cells

Correct Answer: B) Exchange substances between blood and tissues\*

Explanation: Capillaries are the sites of exchange where oxygen, nutrients, and waste products move between blood and surrounding tissues.

---

18. Which of the following substances is transported by the xylem?

A) Sugars

B) Amino acids

C) Water

D) Hormones

Correct Answer: C) Water

Explanation The xylem transports water and dissolved minerals from the roots to the leaves.

---

19. What is the primary function of platelets in the blood?

A) Transport oxygen

B) Fight infections

C) Clotting of blood

D) Transport nutrients

Correct Answer: C) Clotting of blood

Explanation: Platelets are essential for blood clotting, helping to prevent excessive bleeding when injuries occur.

---

20. Which of the following mechanisms is involved in the upward movement of water in plants?

A) Evaporation

B) Transpiration pull

C) Osmosis

D) Diffusion

Correct Answer: B) Transpiration pull

Explanation: Transpiration pull is the process where water evaporates from the leaves, creating a negative pressure that helps pull water upward from the roots.

---

21. Which plant organ is primarily involved in the absorption of water and minerals?

A) Stems

B) Leaves

C) Roots

D) Flowers

Correct Answer: C) Roots

Explanation: Roots are specialized for absorbing water and minerals from the soil.

---

22. What type of blood vessel returns deoxygenated blood to the heart?

A) Artery

B) Capillary

C) Vein

D) Aorta

Correct Answer: C) Vein

Explanation: Veins carry deoxygenated blood back to the heart after it has delivered oxygen to the tissues.

---

23. Which process describes the shrinkage of a plant cell when placed in a hypertonic solution?

A) Turgidity

B) Plasmolysis

C) Osmosis

D) Diffusion

Correct Answer: B) Plasmolysis

Explanation\* Plasmolysis occurs when plant cells lose water in a hypertonic solution, causing the cell membrane to pull away from the cell wall.

---

24. Which component of blood is responsible for the immune response?

A) Plasma

B) Red blood cells

C) White blood cells

D) Platelets

Correct Answer: C) White blood cells

Explanation: White blood cells are crucial for the immune response, defending the body against infections and foreign invaders.

---

25. In which of the following ways do plant cells maintain turgor pressure?

A) By absorbing minerals

B) By taking in water

C) By producing glucose

D) By releasing oxygen

Correct Answer: B) By taking in water

Explanation: Plant cells maintain turgor pressure by absorbing water, which fills the vacuole and pushes against the cell wall.

---

26. Which of the following correctly describes the flow of blood in the mammalian heart?

A) Right atrium → Left atrium → Right ventricle → Left ventricle

B) Left atrium → Left ventricle → Right atrium → Right ventricle

C) Right atrium → Right ventricle → Left atrium → Left ventricle

D) Left atrium → Right atrium → Right ventricle → Left ventricle

Correct Answer: C) Right atrium → Right ventricle → Left atrium → Left ventricle

Explanation: Blood flows from the right atrium to the right ventricle, then to the lungs, returning to the left atrium and finally to the left ventricle.

---

27. Which type of transport requires no energy expenditure?

A) Active transport

B) Passive transport

C) Bulk transport

D) Exocytosis

Correct Answer: B) Passive transport

Explanation: Passive transport occurs without the use of energy, as substances move along their concentration gradient.

---

28. What is the primary role of the aorta in the circulatory system?

A) Return deoxygenated blood to the heart

B) Distribute oxygenated blood to the body

C) Transport blood to the lungs

D) Filter blood in the kidneys

Correct Answer: B) Distribute oxygenated blood to the body

Explanation: The aorta is the main artery that carries oxygenated blood from the heart to the rest of the body.

---

29. Which of the following best describes the role of diffusion in cells?

A) Movement of molecules against their concentration gradient

B) Movement of water through a semi-permeable membrane

C) Movement of molecules from an area of higher concentration to lower concentration

D) Movement of nutrients into the bloodstream

Correct Answer: C) Movement of molecules from an area of higher concentration to lower concentration

Explanation: Diffusion is the passive movement of molecules down their concentration gradient.

---

30. What is the significance of stomata in plants?

A) Photosynthesis

B) Gas exchange

C) Nutrient absorption

D) Water storage

Correct Answer: B) Gas exchange

Explanation: Stomata are small openings on leaves that allow for the exchange of gases (O₂ and CO₂) during photosynthesis and respiration.

---

31. Which of the following is a function of plasma in blood?

A) Transporting oxygen

B) Clotting

C) Transporting nutrients and hormones

D) Fighting infections

Correct Answer: C) Transporting nutrients and hormones

Explanation: Plasma is the liquid component of blood and serves to transport nutrients, hormones, and waste products.

---

32. What mechanism maintains the balance of fluids in the body?

A) Osmosis

B) Diffusion

C) Active transport

D) Filtration

Correct Answer: A) Osmosis

Explanation: osmosis helps regulate fluid balance by controlling the movement of water across cell membranes.

---

33. Which blood vessel carries oxygen-poor blood from the body back to the heart?

A) Pulmonary artery

B) Aorta

C) Pulmonary vein

D) Inferior vena cava

Correct Answer: D) Inferior vena cava

Explanation: The inferior vena cava carries deoxygenated blood from the lower body back to the right atrium of the heart.

---

34. What is the role of the renal artery?

A) Transports oxygenated blood to the kidneys

B) Transports deoxygenated blood away from the kidneys

C) Filters blood

D) Transports nutrients to the kidneys

Correct Answer: A) Transports oxygenated blood to the kidneys

Explanation: The renal artery supplies the kidneys with oxygen-rich blood for filtration.

---

35. Which of the following processes assists in the movement of nutrients from the digestive system to the liver?

A) Diffusion

B) Active transport

C) Hepatic portal circulation

D) Osmosis

Correct Answer: C) Hepatic portal circulation

Explanation:Hepatic portal circulation refers to the pathway that nutrient-rich blood takes from the digestive organs to the liver.

---

36. What is the effect of placing plant cells in a hypotonic solution?

A) Plasmolysis

B) Turgidity

C) Wilting

D) No change

Correct Answer: B) Turgidity

Explanation: In a hypotonic solution, water enters plant cells, causing them to swell and become turgid.

---

37. Which part of the heart receives deoxygenated blood from the body?

A) Left atrium

B) Right atrium

C) Left ventricle

D) Right ventricle

Correct Answer: B) Right atrium

Explanation: The right atrium receives deoxygenated blood from the body through the superior and inferior vena cavae.

---

38. What role do valves play in the circulatory system?

A) Increase blood pressure

B) Prevent backflow of blood

C) Facilitate gas exchange

D) Control heartbeat

Correct Answer: B) Prevent backflow of blood

Explanation: Valves in veins and the heart ensure that blood flows in one direction and prevents backflow.

---

39. Which of the following is a characteristic of closed circulatory systems?

A) Blood is not confined to vessels

B) Blood circulates in a continuous loop

C) Less efficient in oxygen transport

D) Found in most invertebrates

Correct Answer: B) Blood circulates in a continuous loop

Explanation: In closed circulatory systems, blood is contained within vessels, allowing for efficient transport.

---

40. What is the primary function of the lymphatic system?

A) Gas exchange

B) Nutrient transport

C) Immune defense and fluid balance

D) Blood circulation

Correct Answer: C) Immune defense and fluid balance

Explanation: The lymphatic system helps protect the body against infection and maintains fluid balance by returning excess fluid to the bloodstream.

---

41. Which of the following statements about blood pressure is true?

A) It is highest in the veins.

B) It is lowest in the arteries.

C) It is highest in the arteries.

D) It remains constant throughout the circulatory system.

Correct Answer: C) It is highest in the arteries.

Explanation:lood pressure is highest in the arteries, where blood is pumped directly from the heart.

---

42. What is the main purpose of transpiration in plants?

A) Nutrient absorption

B) Cooling the plant

C) Water transport

D) Photosynthesis

Correct Answer: B) Cooling the plant

Explanation: Transpiration helps cool the plant by releasing water vapor, which cools the surface of leaves.

---

43. Which of the following processes helps maintain homeostasis in cells?

A) Filtration

B) Active transport

C) Diffusion

D) All of the above

Correct Answer: D) All of the above

Explanation: Each of these processes plays a role in maintaining homeostasis by regulating the movement of substances in and out of cells.

---

44. What is the key difference between xylem and phloem?

A) Xylem transports sugars; phloem transports water.

B) Xylem transports water; phloem transports sugars.

C) Xylem is found in leaves; phloem is found in roots.

D) Xylem transports hormones; phloem transports gases.

Correct Answer: B) Xylem transports water; phloem transports sugars.

Explanation: Xylem is specialized for water and mineral transport, while phloem is responsible for transporting organic nutrients.

---

45. What is the function of the pulmonary artery?

A) Transports oxygenated blood to the body

B) Transports deoxygenated blood to the lungs

C) Returns oxygenated blood from the lungs to the heart

D) Supplies the heart with blood

Correct Answer: B) Transports deoxygenated blood to the lungs

Explanation: The pulmonary artery carries deoxygenated blood from the heart to the lungs for deoxygenation.

---

46. Which of the following best describes osmosis?

A) Movement of solute from low to high concentration

B) Movement of solvent from high to low concentration

C) Movement of molecules through a semi-permeable membrane

D) Movement of gas in the air

Correct Answer: B) Movement of solvent from high to low concentration

Explanation Osmosis specifically refers to the movement of solvent (usually water) across a semi-permeable membrane from an area of higher concentration to lower concentration.

---

47. How do nutrients enter the bloodstream from the digestive system?

A) Through osmosis

B) Through active transport

C) Through diffusion

D) Through hepatic portal circulation

Correct Answer: D) Through hepatic portal circulation

Explanation: Nutrients absorbed in the intestines are transported to the liver via the hepatic portal vein before entering the general circulation.

---

48. What is the primary function of the circulatory system in plants?

A) Transport of water and minerals

B) Transport of nutrients

C) Structural support

D) Photosynthesis

Correct Answer: A) Transport of water and minerals

Explanation: The vascular system in plants, primarily through xylem, is responsible for transporting water and minerals.

---

49. Which gas is primarily exchanged during respiration in animals?

A) Oxygen

B) Carbon dioxide

C) Nitrogen

D) Hydrogen

Correct Answer: A) Oxygen

**Respiration**

1. What is the primary function of respiration in living organisms?

A) Synthesis of proteins

B) Production of energy

C) Removal of waste products

D) Growth and development

Correct Answer: B) Production of energy

Explanation: Respiration is the process by which organisms convert glucose and oxygen into energy (ATP), which is essential for all cellular activities.

---

2. Which of the following is a respiratory organ in mammals?

A) Stomata

B) Lenticels

C) Lungs

D) Trachea

Correct Answer: C) Lungs

Explanation: Lungs are the primary respiratory organs in mammals, facilitating gas exchange between the air and blood.

---

3. In plants, gas exchange primarily occurs through which structures?

A) Lungs

B) Stomata

C) Gills

D) Trachea

Correct Answer: B) Stomata

Explanation: Stomata are small openings on the surfaces of leaves that allow for the exchange of gases (O₂ and CO₂) during photosynthesis and respiration.

---

4. What is the main product of aerobic respiration?

A) Ethanol

B) Lactic acid

C) Carbon dioxide and water

D) Glucose

Correct Answer: C) Carbon dioxide and water

Explanation: Aerobic respiration uses oxygen to convert glucose into energy, producing carbon dioxide and water as byproducts.

---

5. Anaerobic respiration occurs in the absence of which substance?

A) Glucose

B) Carbon dioxide

C) Oxygen

D) Water

Correct Answer: C) Oxygen

Explanation: Anaerobic respiration takes place in environments where oxygen is not present, leading to alternative pathways for energy production.

---

6. Which process occurs during glycolysis?

A) Conversion of glucose to pyruvate

B) Breakdown of fatty acids

C) Synthesis of nucleotides

D) Production of ATP from ADP

Correct Answer: A) Conversion of glucose to pyruvate

Explanation: Glycolysis is the first step in both aerobic and anaerobic respiration, where glucose is broken down into pyruvate, producing a small amount of ATP.

---

7. What is produced during the Krebs cycle?

A) Glucose

B) Oxygen

C) Carbon dioxide and ATP

D) Lactic acid

Correct Answer: C) Carbon dioxide and ATP

Explanation: The Krebs cycle, also known as the citric acid cycle, produces carbon dioxide and ATP while regenerating compounds needed for further reactions.

---

8. What role does oxygen play in cellular respiration?

A) It is a byproduct

B) It acts as an electron acceptor

C) It is used to synthesize glucose

D) It catalyzes reactions

Correct Answer: B) It acts as an electron acceptor

Explanation: In aerobic respiration, oxygen acts as the final electron acceptor in the electron transport chain, allowing for the production of ATP.

---

9. Which of the following statements about fermentation is true?

A) It requires oxygen

B) It produces more ATP than aerobic respiration

C) It occurs in yeast and some bacteria

D) It only occurs in animals

Correct Answer: C) It occurs in yeast and some bacteria

Explanation: Fermentation is an anaerobic process that occurs in yeast and some bacteria, converting sugars to alcohol or acids and producing ATP.

---

10. How do plants regulate the opening and closing of stomata?

A) By using energy from sunlight

B) Through the action of guard cells

C) By changing leaf color

D) By absorbing water

Correct Answer: B) Through the action of guard cells

Explanation: Guard cells surround each stoma and control its opening and closing by changing shape, regulating gas exchange and water loss.

---

11. What is a significant effect of insufficient oxygen supply to muscles?

A) Increased energy production

B) Accumulation of lactic acid

C) Enhanced endurance

D) Improved aerobic capacity

Correct Answer: B) Accumulation of lactic acid

Explanation: Insufficient oxygen during strenuous exercise leads to anaerobic respiration, resulting in lactic acid buildup in muscles, which can cause fatigue.

---

12. Which of the following describes the process of gas exchange in animals?

A) Absorption of nutrients

B) Diffusion of gases across membranes

C) Active transport of ions

D) Osmosis of water

Correct Answer: B) Diffusion of gases across membranes

Explanation: Gas exchange in animals occurs through diffusion, where oxygen enters and carbon dioxide exits through respiratory surfaces.

---

13. What is the primary end product of anaerobic respiration in yeast?

A) Carbon dioxide

B) Ethanol

C) Glucose

D) Oxygen

Correct Answer: B) Ethanol

Explanation: In yeast, anaerobic respiration (fermentation) converts glucose into ethanol and carbon dioxide, which is used in brewing and baking.

---

14. Which of the following is NOT a respiratory surface in organisms?

A) Lungs

B) Gills

C) Stomata

D) Kidneys

Correct Answer: D) Kidneys

Explanation: Kidneys are not involved in gas exchange; they are part of the excretory system, while lungs, gills, and stomata are respiratory surfaces.

---

15. The process of heat energy exchange during respiration can be measured through which of the following?

A) Photosynthesis

B) Fermentation

C) Calorimetry

D) Osmosis

Correct Answer: C) Calorimetry

Explanation: Calorimetry is used to measure the heat released or absorbed during respiration, indicating the energy changes involved in the process.

---

16. What is the function of tracheae in insects?

A) Gas exchange

B) Nutrient transport

C) Waste elimination

D) Reproduction

Correct Answer: A) Gas exchange

Explanation: Tracheae are respiratory tubes in insects that facilitate gas exchange directly with body tissues by delivering oxygen and removing carbon dioxide.

---

17. Which statement about aerobic respiration is FALSE?

A) It produces more ATP than anaerobic respiration.

B) It requires oxygen.

C) It occurs in the mitochondria.

D) It involves only glycolysis.

Correct Answer: D) It involves only glycolysis.

Explanation: Aerobic respiration includes glycolysis, the Krebs cycle, and the electron transport chain, making it more complex than just glycolysis.

---

18. What is the primary role of the respiratory system in plants?

A) Nutrient absorption

B) Gas exchange

C) Water storage

D) Photosynthesis

Correct Answer: B) Gas exchange

Explanation: The primary role of the respiratory system in plants is to facilitate gas exchange (O₂ and CO₂) necessary for respiration and photosynthesis.

---

19. Which of the following products is produced during anaerobic respiration in muscle cells?

A) Glucose

B) Oxygen

C) Lactic acid

D) Carbon dioxide

Correct Answer: C) Lactic acid

Explanation: In muscle cells, anaerobic respiration produces lactic acid when oxygen levels are low, leading to muscle fatigue.

---

20. The process of photosynthesis can be described as the reverse of which process?

A) Glycolysis

B) Fermentation

C) Anaerobic respiration

D) Aerobic respiration

Correct Answer: D) Aerobic respiration

Explanation: Photosynthesis converts carbon dioxide and water into glucose and oxygen, which are the reactants of aerobic respiration, effectively reversing the process.

---

21. What is the significance of the Krebs cycle in respiration?

A) It produces glucose.

B) It generates ATP and electron carriers.

C) It removes carbon dioxide.

D) It converts lactic acid to pyruvate.

Correct Answer: B) It generates ATP and electron carriers.

Explanation: The Krebs cycle produces ATP and electron carriers (NADH and FADH₂) that are used in the electron transport chain for further ATP production.

---

22. Which of the following best describes the role of guard cells?

A) They absorb water.

B) They regulate stomatal opening.

C) They transport nutrients.

D) They perform photosynthesis.

Correct Answer: B) They regulate stomatal opening.

Explanation: Guard cells control the opening and closing of stomata, affecting gas exchange and transpiration in plants.

---

23. During respiration, heat energy is produced as a byproduct. This is an example of:

A) Kinetic energy

B) Potential energy

C) Chemical energy

D) Thermal energy

Correct Answer: D) Thermal energy

Explanation: The heat produced during respiration is a form of thermal energy released during the breakdown of glucose.

---

24. Which of the following is a characteristic of aerobic respiration?

A) It occurs without oxygen.

B) It produces less energy than anaerobic respiration.

C) It occurs in the mitochondria.

D) It results in the accumulation of lactic acid.

Correct Answer: C) It occurs in the mitochondria.

Explanation: Aerobic respiration occurs in the mitochondria of cells, where oxygen is used to produce ATP.

---

25. What is the primary purpose of the respiratory system in animals?

A) To regulate temperature

B) To provide structural support

C) To exchange gases

D) To produce waste

Correct Answer: C) To exchange gases

Explanation: The primary purpose of the respiratory system in animals is to facilitate the exchange of oxygen and carbon dioxide.

---

26. What is the effect of increased carbon dioxide levels on stomata?

A) Stomata remain closed

B) Stomata open wider

C) Stomata close completely

D) Stomata have no effect

Correct Answer: A) Stomata remain closed

Explanation: High levels of carbon dioxide can signal the plant to close stomata to reduce gas exchange, conserving water.

---

27. In which type of respiration is ATP produced directly from the substrate?

A) Aerobic respiration

B) Anaerobic respiration

C) Glycolysis

D) Krebs cycle

Correct Answer: C) Glycolysis

Explanation: Glycolysis is the only phase of respiration that produces ATP directly from the breakdown of glucose without the need for oxygen.

---

28. Lenticels are involved in gas exchange in which type of organism?

A) Aquatic plants

B) Terrestrial plants

C) Insects

D) Mammals

Correct Answer: B) Terrestrial plants

Explanation: Lenticels are small openings in the bark of woody plants that allow for gas exchange, particularly in non-photosynthetic tissues.

---

29. What is produced when yeast ferments sugars?

A) Glucose

B) Ethanol and carbon dioxide

C) Lactic acid

D) Oxygen

Correct Answer: B) Ethanol and carbon dioxide

Explanation: During fermentation, yeast converts sugars into ethanol and carbon dioxide, which are important in brewing and baking.

---

30. Which of the following statements about anaerobic respiration is TRUE?

A) It requires oxygen.

B) It produces more energy than aerobic respiration.

C) It occurs in all organisms.

D) It can lead to the production of lactic acid in animals.

Correct Answer: D) It can lead to the production of lactic acid in animals.

Explanation: Anaerobic respiration in animals can produce lactic acid when oxygen is scarce, particularly during intense exercise.

---

31. The primary function of gills in fish is:

A) Nutrient absorption

B) Gas exchange

C) Excretion

D) Circulation

Correct Answer: B) Gas exchange\*\*

Explanation: Gills are specialized organs in fish that facilitate the exchange of oxygen and carbon dioxide with water.

---

32. What is the main energy currency produced during respiration?

A) DNA

B) RNA

C) ATP

D) ADP

Correct Answer: C) ATP

Explanation: ATP (adenosine triphosphate) is the primary energy currency produced during respiration, used for various cellular processes.

---

33. What happens to muscle cells when oxygen supply is insufficient during intense exercise?

A) They undergo aerobic respiration

B) They become more efficient

C) They produce energy without oxygen

D) They cease functioning

Correct Answer: C) They produce energy without oxygen

Explanation: When oxygen is insufficient, muscle cells switch to anaerobic respiration, producing energy through processes that do not require oxygen.

---

34. Which type of respiration occurs in all living cells?

A) Anaerobic respiration

B) Aerobic respiration

C) Both anaerobic and aerobic respiration

D) Photosynthesis

Correct Answer: C) Both anaerobic and aerobic respiration

Explanation: Both types of respiration occur in living cells, depending on the availability of oxygen and the organism's requirements.

---

35. What is the main function of the respiratory system in plants?

A) Nutrient transport

B) Photosynthesis

C) Gas exchange

D) Water absorption

Correct Answer: C) Gas exchange

Explanation: The primary function of the plant respiratory system is to facilitate gas exchange for respiration and photosynthesis.

---

36. What is the significance of heat energy production during respiration?

A) It indicates inefficiency

B) It contributes to body temperature regulation

C) It is a waste product

D) It enhances enzyme activity

Correct Answer: B) It contributes to body temperature regulation

Explanation: The heat produced during respiration helps maintain body temperature in warm-blooded organisms.

---

37. Which of the following is NOT a respiratory organ in animals?

A) Gills

B) Skin

C) Lungs

D) Roots

Correct Answer: D) Roots

Explanation: Roots are not involved in respiration; they primarily function in nutrient and water absorption.

---

38. Which gas is a byproduct of aerobic respiration?

A) Nitrogen

B) Carbon dioxide

C) Hydrogen

D) Methane

Correct Answer: B) Carbon dioxide

Explanation: Carbon dioxide is produced as a byproduct of aerobic respiration when glucose is broken down in the presence of oxygen.

---

39. During which stage of respiration is the majority of ATP produced?

A) Glycolysis

B) Krebs cycle

C) Electron transport chain

D) Fermentation

Correct Answer: C) Electron transport chain

Explanation: The electron transport chain produces the majority of ATP during respiration by utilizing high-energy electrons from NADH and FADH₂.

---

40. What is the primary role of alveoli in the lungs?

A) Nutrient absorption

B) Gas exchange

C) Blood filtration

D) Waste elimination

Correct Answer: B) Gas exchange

Explanation:\*\* Alveoli are tiny air sacs in the lungs where gas exchange occurs, allowing oxygen to enter the blood and carbon dioxide to be expelled.

---

41. Which of the following best describes the process of diffusion?

A) Movement of water through a membrane

B) Movement of molecules from low to high concentration

C) Movement of molecules from high to low concentration

D) Movement of solutes through active transport

Correct Answer: C) Movement of molecules from high to low concentration

Explanation: Diffusion is the passive movement of molecules from an area of higher concentration to an area of lower concentration.

---

42. The process of cellular respiration is crucial for:

A) Producing glucose

B) Generating energy for cellular activities

C) Synthesizing proteins

D) Removing toxins

Correct Answer: B) Generating energy for cellular activities

Explanation: Cellular respiration produces ATP, which is essential for various cellular activities and metabolic processes.

---

43. What is the role of oxygen in aerobic respiration?

A) It is converted to glucose

B) It acts as a final electron acceptor

C) It is a byproduct

D) It is not required

Correct Answer: B) It acts as a final electron acceptor

Explanation: Oxygen serves as the final electron acceptor in the electron transport chain, enabling the production of ATP.

---

44. Which of the following describes the anaerobic respiration process in yeast?

A) Lactic acid fermentation

B) Alcoholic fermentation

C) Aerobic respiration

D) Glycolysis

Correct Answer: B) Alcoholic fermentation

Explanation: Yeast undergoes alcoholic fermentation, converting sugars into ethanol and carbon dioxide without oxygen.

---

45. Lactic acid is produced in muscles during:

A) Aerobic respiration

B) Anaerobic respiration

C) Photosynthesis

D) Krebs cycle

Correct Answer: B) Anaerobic respiration

Explanation: Lactic acid is produced when muscles undergo anaerobic respiration due to insufficient oxygen during intense exercise.

---

46. Which type of respiration produces the least amount of energy?

A) Aerobic respiration

B) Anaerobic respiration

C) Both produce equal energy

D) Photosynthesis

Correct Answer: B) Anaerobic respiration

Explanation: Anaerobic respiration produces significantly less ATP compared to aerobic respiration due to incomplete breakdown of glucose.

---

47. The stoma is an important structure in plants primarily for:

A) Nutrient transport

B) Photosynthesis

C) Gas exchange

D) Seed dispersal

Correct Answer: C) Gas exchange

Explanation: The stoma facilitates gas exchange, allowing carbon dioxide to enter and oxygen to exit the leaf.

---

48. In which part of the cell does glycolysis occur?

A) Mitochondria

B) Cytoplasm

C) Nucleus

D) Ribosomes

Correct Answer: B) Cytoplasm

Explanation: Glycolysis occurs in the cytoplasm of the cell, where glucose is broken down into pyruvate.

---

49. What is the primary function of the respiratory system in mammals?

A) To provide structural support

B) To regulate blood pressure

C) To facilitate gas exchange

D) To transport nutrients

Correct Answer: C) To facilitate gas exchange

Explanation: The respiratory system's main function is to exchange oxygen and carbon dioxide between the body and the environment.

---

50. Which of the following processes is NOT part of cellular respiration?

A) Glycolysis

B) Krebs cycle

C) Photosynthesis

D) Electron transport chain

Correct Answer: C) Photosynthesis

Explanation: Photosynthesis is a separate process that converts light energy into chemical energy, while cellular respiration breaks down glucose to release energy.

1. **Excretion**

1. What is the primary purpose of excretion in living organisms?

A) To produce energy

B) To remove waste products

C) To absorb nutrients

D) To facilitate growth

Correct Answer: B) To remove waste products

Explanation: Excretion is the process of removing metabolic waste products from the body, which is crucial for maintaining homeostasis and preventing toxicity.

---

2. Which of the following structures is responsible for excretion in protozoa?

A) Nephridium

B) Malpighian tubule

C) Contractile vacuole

D) Kidney

Correct Answer: C) Contractile vacuole

Explanation: The contractile vacuole in protozoa helps to expel excess water and waste products, playing a key role in osmoregulation and excretion.

---

3. Which excretory structure is found in earthworms?

A) Flame cell

B) Nephridium

C) Malpighian tubule

D) Kidney

Correct Answer: B) Nephridium

Explanation: Nephridia are the excretory structures in earthworms, responsible for filtering waste from the coelomic fluid and excreting it.

---

4. What is the primary excretory product of the lungs?

A) Urea

B) Carbon dioxide

C) Ammonia

D) Water

Correct Answer: B) Carbon dioxide

Explanation: The lungs excrete carbon dioxide, a waste product of cellular respiration, during the process of breathing.

---

5. Which excretory structure is characteristic of insects?

A) Nephridium

B) Malpighian tubule

C) Kidney

D) Stoma

Correct Answer: B) Malpighian tubule

Explanation: Malpighian tubules are excretory structures in insects that remove nitrogenous waste and help in osmoregulation.

---

6. What is the main excretory product of plants?

A) Urea

B) Ammonia

C) Oxygen

D) Carbon dioxide

Correct Answer: D) Carbon dioxide

Explanation: Plants excrete carbon dioxide as a byproduct of respiration, while oxygen is produced during photosynthesis.

---

7. Which of the following is a waste product excreted by the skin?

A) Urea

B) Carbon dioxide

C) Water

D) All of the above

Correct Answer: D) All of the above

Explanation: The skin excretes urea, carbon dioxide, and water through sweat, helping to regulate body temperature and remove waste.

---

8. The kidneys perform which of the following functions?

A) Filtration of blood

B) Production of insulin

C) Absorption of nutrients

D) Hormone production

Correct Answer: A) Filtration of blood

Explanation: The kidneys filter waste products from the blood, regulate electrolyte balance, and maintain fluid homeostasis.

---

9. What is the significance of excretion in organisms?

A) It aids in digestion

B) It helps in growth

C) It maintains homeostasis

D) It produces energy

Correct Answer: C) It maintains homeostasis

Explanation: Excretion is vital for maintaining the internal environment of organisms by removing harmful metabolic wastes and regulating fluid balance.

---

10. Which excretory product is primarily produced by the liver?

A) Urea

B) Ammonia

C) Carbon dioxide

D) Water

Correct Answer: A) Urea

Explanation: Urea is produced in the liver from ammonia and is excreted by the kidneys, serving as a less toxic waste product.

---

11. What is the role of the flame cell?

A) Photosynthesis

B) Excretion

C) Digestion

D) Respiration

Correct Answer: B) Excretion

Explanation: Flame cells are excretory structures in flatworms that help in the removal of waste products and osmoregulation.

---

12. In which organism would you find stomata?

A) Fish

B) Insects

C) Plants

D) Mammals

Correct Answer: C) Plants

Explanation: Stomata are small openings on the surfaces of leaves that facilitate gas exchange and water vapor release, playing a role in excretion.

---

13. What is the primary function of the nephrons in the kidney?

A) Hormone production

B) Blood filtration

C) Nutrient absorption

D) Oxygen transport

Correct Answer: B) Blood filtration

Explanation: Nephrons are the functional units of the kidney that filter blood to remove waste products and excess substances.

---

14. Which of the following is a characteristic of the skin's excretory function?

A) It only excretes urea

B) It regulates body temperature

C) It absorbs nutrients

D) It does not play a role in homeostasis

Correct Answer: B) It regulates body temperature

\*\*Explanation:\*\* The skin helps regulate body temperature through sweating, which also removes waste products like urea and salts.

---

15. What substance is primarily excreted by the kidneys?

A) Glucose

B) Urea

C) Amino acids

D) Fatty acids

Correct Answer: B) Urea

Explanation: The kidneys excrete urea, a waste product formed from protein metabolism, along with other substances like water and electrolytes.

---

16. Which structure in plants is involved in gas exchange?

A) Lenticels

B) Roots

C) Stems

D) Petals

Correct Answer: A) Lenticels

Explanation: Lenticels are small openings on the stems of woody plants that allow for gas exchange, facilitating respiration.

---

17. How do contractile vacuoles function in excretion?

A) They absorb nutrients

B) They expel waste and excess water

C) They produce energy

D) They assist in digestion

Correct Answer: B) They expel waste and excess water

Explanation: Contractile vacuoles in unicellular organisms contract to expel excess water and waste products, helping maintain osmotic balance.

---

18. What role do the lungs play in excretion?

A) Absorb nutrients

B) Filter blood

C) Remove carbon dioxide

D) Produce hormones

Correct Answer: C) Remove carbon dioxide

Explanation: The lungs are responsible for excreting carbon dioxide, a byproduct of cellular respiration, through the process of breathing.

---

19. What is the main excretory product of fermentation in yeast?

A) Ethanol

B) Urea

C) Carbon dioxide

D) Lactic acid

Correct Answer: A) Ethanol

\*\*Explanation:\*\* Yeast cells produce ethanol and carbon dioxide during alcoholic fermentation when sugars are metabolized anaerobically.

---

20. Which statement about urea is correct?

A) It is highly toxic.

B) It is less toxic than ammonia.

C) It is excreted by the lungs.

D) It is produced by photosynthesis.

Correct Answer: B) It is less toxic than ammonia.

Explanation: Urea is less toxic than ammonia, making it a safer way for organisms to excrete nitrogenous waste.

---

21. What is the function of the Malpighian tubules in insects?

A) Digestion

B) Respiration

C) Excretion

D) Circulation

Correct Answer: C) Excretion

Explanation: Malpighian tubules are excretory structures in insects that help eliminate nitrogenous wastes and regulate water balance.

---

22. Which gas is released as a byproduct of respiration in animals?

A) Oxygen

B) Nitrogen

C) Carbon dioxide

D) Hydrogen

Correct Answer: C) Carbon dioxide

Explanation: Carbon dioxide is produced as a waste product during aerobic respiration in animals and is expelled through the lungs.

---

23. What is the significance of excretory products in plants?

A) They are used for photosynthesis.

B) They help in nutrient absorption.

C) They can have economic importance.

D) They do not play any significant role.

Correct Answer: C) They can have economic importance.

Explanation: Excretory products like tannins, resins, and gums can have various uses in industry, medicine, and agriculture.

---

24. Which part of the kidney is responsible for reabsorbing water?

A) Glomerulus

B) Loop of Henle

C) Bowman's capsule

D) Ureter

Correct Answer: B) Loop of Henle

Explanation: The Loop of Henle plays a crucial role in reabsorbing water and concentrating urine in the kidneys.

---

25. What is the primary waste product excreted by the skin?

A) Carbon dioxide

B) Urea

C) Nitrogen

D) Oxygen

Correct Answer: B) Urea

Explanation: The skin excretes urea along with other waste products, contributing to the overall excretory processes of the body.

---

26. Which of the following structures is not involved in excretion?

A) Kidney

B) Lungs

C) Stomach

D) Skin

Correct Answer: C) Stomach

Explanation: The stomach is primarily involved in digestion, not excretion.

---

27. What role do stomata play in plants?

A) Nutrient absorption

B) Gas exchange

C) Water storage

D) Seed production

Correct Answer: B) Gas exchange

Explanation: Stomata are openings on leaf surfaces that allow for the exchange of gases (CO₂ and O₂) during photosynthesis and respiration.

---

28. Which of the following is a characteristic of the excretory system in mammals?

A) It has no filtration mechanism.

B) It utilizes kidneys for filtration.

C) It only removes solid wastes.

D) It does not regulate water balance.

Correct Answer: B) It utilizes kidneys for filtration.

Explanation: The mammalian excretory system uses kidneys to filter blood and remove waste products while regulating water and electrolyte balance.

---

29. What is the effect of insufficient oxygen supply on muscles?

A) Increased energy production

B) Lactic acid accumulation

C) Enhanced aerobic respiration

D) No effect

Correct Answer: B) Lactic acid accumulation

Explanation: Insufficient oxygen during strenuous activity leads to anaerobic respiration, resulting in lactic acid buildup in muscles, causing fatigue.

---

30. Which excretory structure is found in flatworms?

A) Malpighian tubule

B) Nephridium

C) Kidney

D) Stoma

Correct Answer: B) Nephridium

Explanation: Nephridia are excretory structures in flatworms that help in the removal of waste and regulation of body fluids.

---

31. What is the primary excretory product of yeast during fermentation?

A) Glucose

B) Ethanol

C) Urea

D) Carbon dioxide

Correct Answer: B) Ethanol

Explanation: Yeast produces ethanol and carbon dioxide as byproducts of fermentation when sugars are broken down anaerobically.

---

32. Which of the following statements is true about the kidneys?

A) They filter blood to produce urine.

B) They only excrete solid waste.

C) They do not play a role in homeostasis.

D) They are found in all invertebrates.

Correct Answer: A) They filter blood to produce urine.

Explanation: The kidneys filter blood to remove waste products and excess substances, producing urine as a result.

---

33. Which structure is primarily responsible for gas exchange in fish?

A) Stomata

B) Lungs

C) Gills

D) Skin

Correct Answer: C) Gills

Explanation: Gills are the primary respiratory structures in fish that facilitate the exchange of oxygen and carbon dioxide in water.

---

34. Which of the following is true about urea?

A) It is excreted through the skin.

B) It is produced in the kidneys.

C) It is less toxic than ammonia.

D) It is primarily excreted by the lungs.

Correct Answer: C) It is less toxic than ammonia.

Explanation: Urea is formed from ammonia in the liver and is less toxic, making it a safer waste product for excretion.

---

35. What is the function of the glomerulus in the kidney?

A) Reabsorb water

B) Filter blood

C) Secrete hormones

D) Store urine

Correct Answer: B) Filter blood

Explanation:The glomerulus is a network of capillaries in the kidney that filters blood to form urine.

---

36. Which of the following gases do plants excrete during respiration?

A) Oxygen

B) Nitrogen

C) Carbon dioxide

D) Hydrogen

Correct Answer: C) Carbon dioxide

Explanation: Plants excrete carbon dioxide as a waste product of cellular respiration, especially at night when photosynthesis does not occur.

---

37. How do plants excrete excess water?

A) Through roots

B) Through transpiration

C) Through fruits

D) Through flowers

Correct Answer: B) Through transpiration

Explanation: Plants excrete excess water primarily through transpiration, where water vapor escapes from stomata in the leaves.

---

38. What is the primary role of the skin in excretion?

A) Digestion

B) Temperature regulation

C) Waste removal

D) Circulation

Correct Answer: C) Waste removal

Explanation: The skin helps in excreting waste products like urea and salts through sweat, in addition to regulating body temperature.

---

39. Which plants structures are involved in excretion?

A) Roots

B) Leaves

C) Stomata and lenticels

D) Flowers

Correct Answer: C) Stomata and lenticels

Explanation: Stomata and lenticels are involved in gas exchange, which is an important aspect of excretion in plants.

---

40. What is the result of anaerobic respiration in muscles?

A) Increased aerobic capacity

B) Lactic acid production

C) Higher energy yield

D) Oxygen consumption

Correct Answer: B) Lactic acid production

Explanation: Anaerobic respiration in muscles leads to lactic acid production, especially during intense exercise when oxygen supply is low.

---

41. How do kidneys regulate blood pressure?

A) By filtering urea

B) By excreting glucose

C) By controlling water balance

D) By absorbing nutrients

Correct Answer: C) By controlling water balance

Explanation: The kidneys regulate blood pressure by controlling the volume of blood through the excretion or retention of water.

---

42. Which of the following is not an excretory product of plants?

A) Oxygen

B) Carbon dioxide

C) Tannins

D) Glucose

Correct Answer: D) Glucose

Explanation: Glucose is not an excretory product; rather, it is a primary energy source produced during photosynthesis.

---

43. What is the role of the skin in thermoregulation?

A) It absorbs nutrients.

B) It filters blood.

C) It removes waste products.

D) It secretes sweat.

Correct Answer: D) It secretes sweat.

Explanation: The skin regulates body temperature by secreting sweat, which cools the body through evaporation.

---

44. Which excretory structure is responsible for filtering blood in mammals?

A) Stoma

B) Kidney

C) Trachea

D) Gills

Correct Answer: B) Kidney

Explanation: The kidneys are responsible for filtering blood, removing waste products, and regulating fluids in mammals.

---

45. What is the primary excretory product of aerobic respiration?

A) Ethanol

B) Urea

C) Carbon dioxide

D) Lactic acid

Correct Answer: C) Carbon dioxide

Explanation: Carbon dioxide is produced as a waste product during aerobic respiration when glucose is metabolized with oxygen.

--- 46. In which part of the kidney does filtration occur?

A) Renal pelvis

B) Ureter

C) Glomerulus

D) Collecting duct

Correct Answer: C) Glomerulus

Explanation: Filtration occurs in the glomerulus, where blood is filtered to form urine.

---

47. Which of the following is a nitrogenous waste product?

A) Glucose

B) Urea

C) Oxygen

D) Carbon dioxide

Correct Answer: B) Urea

Explanation: Urea is a nitrogenous waste product formed from the metabolism of proteins and is excreted by the kidneys.

---

48. What is the significance of the Malpighian tubules in insects?

A) They assist in respiration.

B) They aid in digestion.

C) They help in excretion and osmoregulation.

D) They produce energy.

Correct Answer: C) They help in excretion and osmoregulation.

Explanation: Malpighian tubules in insects are crucial for excreting waste and regulating water balance in their bodies.

---

49. Which gas is primarily absorbed by plants during photosynthesis?

A) Oxygen

B) Carbon dioxide

C) Nitrogen

D) Hydrogen

Correct Answer: B) Carbon dioxide

Explanation: Plants absorb carbon dioxide during photosynthesis to produce glucose and oxygen.

---

50. What are the primary excretory products of fermentation in yeast?

A) Glucose and oxygen

B) Ethanol and carbon dioxide

C) Urea and ammonia

D) Lactic acid and glucose

Correct Answer: B) Ethanol and carbon dioxide

Explanation: Yeast produces ethanol and carbon dioxide as byproducts of anaerobic fermentation of sugars.

---

51. Which of the following organs is responsible for excreting urea?

A) Skin

B) Lungs

C) Kidneys

D) Stomach

Correct Answer: C) Kidneys

Explanation: The kidneys filter urea from the blood and excrete it in urine, playing a key role in nitrogen waste removal.

---

52. What is the primary role of the trachea in insects?

A) Nutrient absorption

B) Gas exchange

C) Waste removal

D) Blood filtration

Correct Answer: B) Gas exchange

Explanation: Insects use the trachea to transport oxygen directly to tissues, facilitating gas exchange.

1. **Support and movement**

1. What are tropic movements in plants?

A) Movements in response to touch

B) Growth movements toward or away from stimuli

C) Movements during sleep

D) Random movements

Correct Answer: B) Growth movements toward or away from stimuli

Explanation: Tropic movements are directional growth responses of plants to environmental stimuli such as light (phototropism) and gravity (geotropism).

2. What type of skeleton is found externally on organisms like insects?

A) Endoskeleton

B) Exoskeleton

C) Hydrostatic skeleton

D) Cartilaginous skeleton

Correct Answer: B) Exoskeleton

Explanation: An exoskeleton is a rigid external covering that provides support and protection to organisms such as arthropods.

3. Which of the following is a function of the skeleton in animals?

A) Photosynthesis

B) Digestion

C) Support and protection

D) Respiration

Correct Answer: C) Support and protection

Explanation: The skeleton provides structural support for the body and protects vital organs.

4. What type of supporting tissue is collenchyma?

A) Parenchyma

B) Sclerenchyma

C) Flexible supporting tissue

D) Vascular tissue

Correct Answer: C) Flexible supporting tissue

Explanation: Collenchyma provides flexible support to growing parts of plants, especially in stems and leaves.

5. Which of the following is NOT a type of joint?

A) Hinge joint

B) Ball and socket joint

C) Fixed joint

D) Fluid joint

Correct Answer: D) Fluid joint

Explanation: Fluid joint is not a recognized type of joint; the main types include hinge, ball and socket, and fixed joints.

6. What is the primary role of auxins in plants?

A) Water absorption

B) Photosynthesis

C) Growth regulation

D) Nutrient storage

Correct Answer: C) Growth regulation

Explanation: Auxins are plant hormones that regulate growth, particularly in response to stimuli such as light and gravity.

7. Which supporting tissue provides the most rigid support in plants?

A) Parenchyma

B) Collenchyma

C) Sclerenchyma

D) Xylem

Correct Answer: C) Sclerenchyma

Explanation: Sclerenchyma consists of thick-walled cells that provide the strongest support in plants.

8. What is the primary function of cartilage in the skeleton?

A) Flexibility and support

B) Blood production

C) Energy storage

D) Sensory function

Correct Answer: A) Flexibility and support

Explanation: Cartilage provides flexible support and reduces friction between bones at joints.

9. What type of skeleton do vertebrates have?

A) Exoskeleton

B) Endoskeleton

C) Hydrostatic skeleton

D) External skeleton

Correct Answer: B) Endoskeleton

Explanation: Vertebrates possess an endoskeleton, which is an internal framework made of bone and cartilage.

10. How do plants respond to gravity?

A) By wilting

B) Through geotropism

C) By photosynthesis

D) Through phototropism

Correct Answer: B) Through geotropism

Explanation: Geotropism is the growth response of plants to gravity, with roots growing downward and stems growing upward.

11. Which of the following is a primary function of the skeletal system?

A) Immune response

B) Nutrient absorption

C) Movement

D) Hormone production

Correct Answer: C) Movement

Explanation: The skeletal system, in conjunction with muscles, allows for movement of the body.

12. What type of movement is nastic movement?

A) Directional growth

B) Non-directional movement

C) Sleep movement

D) Growth movement

Correct Answer: B) Non-directional movement

Explanation: Nastic movements are non-directional responses to stimuli, such as the opening and closing of flowers.

13. What is the role of chitin in the exoskeleton of arthropods?

A) To provide flexibility

B) To provide rigidity and protection

C) To store energy

D) To facilitate movement

Correct Answer: B) To provide rigidity and protection

Explanation: Chitin is a tough polysaccharide that contributes to the strength and protection of the exoskeleton in arthropods.

14. What is the function of the xylem in plants?

A) Transport of food

B) Transport of water and minerals

C) Storage of nutrients

D) Photosynthesis

Correct Answer: B) Transport of water and minerals

Explanation: The xylem is responsible for transporting water and dissolved minerals from the roots to the rest of the plant.

15. What type of joint allows for the greatest range of motion?

A) Hinge joint

B) Ball and socket joint

C) Pivot joint

D) Immovable joint

Correct Answer: B) Ball and socket joint

Explanation: Ball and socket joints, such as the shoulder and hip joints, allow for multi-directional movement.

16. What is the main support function of the endoskeleton?

A) Energy storage

B) Protection of internal organs

C) Hormone production

D) Nutrient absorption

Correct Answer: B) Protection of internal organs

Explanation: The endoskeleton provides structural support and protects vital internal organs from injury.

17. Which of the following is a characteristic of the mammalian skeleton?

A) Rigid and immovable

B) Flexible and lightweight

C) Composed of cartilage only

D) Composed of bone and cartilage

Correct Answer: D) Composed of bone and cartilage

Explanation: The mammalian skeleton consists of both bone and cartilage, providing structure and flexibility.

18. What type of movement do plants exhibit in response to light?

A) Nastic movement

B) Tropic movement

C) Tactic movement

D) Random movement

Correct Answer: B) Tropic movement

Explanation: Tropic movements involve growth towards or away from a light source, known as phototropism.

19. What is the primary role of supporting tissues in plants?

A) Nutrient storage

B) Providing structure and support

C) Photosynthesis

D) Water absorption

Correct Answer: B) Providing structure and support

Explanation: Supporting tissues like collenchyma and sclerenchyma help maintain the plant's structure and integrity.

20. What is the role of auxins in tropic movements?

A) To inhibit growth

B) To promote growth on the side away from the stimulus

C) To promote growth on the side toward the stimulus

D) To cause wilting

Correct Answer: C) To promote growth on the side toward the stimulus

Explanation: Auxins facilitate growth on the side of the plant that is away from the stimulus, causing bending toward it.

21. Which type of joint is found in the elbow?

A) Hinge joint

B) Ball and socket joint

C) Pivot joint

D) Gliding joint

Correct Answer: A) Hinge joint

Explanation: The elbow joint is a hinge joint, allowing movement primarily in one direction.

### 22. What supporting structure is found in the roots of plants?

A) Phloem

B) Xylem

C) Collenchyma

D) Sclerenchyma

Correct Answer: B) Xylem

Explanation: Xylem provides structural support and transports water and nutrients in plant roots.

23. In which part of the plant would you find stomata?

A) Roots

B) Stems

C) Leaves

D) Flowers

Correct Answer: C) Leaves

Explanation: Stomata are small openings on the leaves that allow gas exchange for photosynthesis and respiration.

24. Which of the following is NOT a function of the skeleton?

A) Protection

B) Blood production

C) Hormone secretion

D) Support

Correct Answer: C) Hormone secretion

Explanation: While the skeleton plays a role in protection, support, and blood production, it does not secrete hormones.

25. What is the primary function of the Malpighian tubules in insects?

A) Gas exchange

B) Excretion of nitrogenous wastes

C) Nutrient absorption

D) Energy production

Correct Answer: B) Excretion of nitrogenous wastes

Explanation: Malpighian tubules are responsible for excreting nitrogenous wastes in insects.

26. Which of the following tissues provides the most support in plants?

A) Parenchyma

B) Xylem

C) Collenchyma

D) Sclerenchyma

Correct Answer: D) Sclerenchyma

Explanation: Sclerenchyma consists of thick, lignified walls that provide the strongest support.

27. What is the significance of the skin in excretion?

A) It stores nutrients

B) It produces energy

C) It excretes water and salts

D) It aids in digestion

Correct Answer: C) It excretes water and salts

Explanation: The skin plays a role in excreting waste products such as water, salts, and urea through sweat.

28. What is the role of the diaphragm in respiration?

A) To filter air

B) To expand and contract the lungs

C) To transport oxygen

D) To produce carbon dioxide

Correct Answer: B) To expand and contract the lungs

Explanation: The diaphragm is a muscle that helps in the inhalation and exhalation process by changing the pressure in the thoracic cavity.

29. Which of the following is a characteristic of an endoskeleton?

A) It is external

B) It is made entirely of cartilage

C) It can grow with the organism

D) It is rigid and immovable

Correct Answer: C) It can grow with the organism

Explanation: An endoskeleton can grow and adapt along with the organism, allowing for growth and flexibility.

30. What is the primary function of supporting tissues like cartilage?

A) Energy storage

B) Providing flexibility and support

C) Photosynthesis

D) Water absorption

Correct Answer: B) Providing flexibility and support

Explanation: Cartilage provides flexible support to joints and structures within the body.

31. Which type of muscle is involved in voluntary movement?

A) Cardiac muscle

B) Smooth muscle

C) Skeletal muscle

D) Involuntary muscle

Correct Answer: C) Skeletal muscle

Explanation: Skeletal muscle is under voluntary control, allowing for conscious movement of the body.

32. How do plants primarily absorb water?

A) Through leaves

B) Through roots

C) Through stems

D) Through flowers

Correct Answer: B) Through roots

Explanation: Roots are specialized for the absorption of water and nutrients from the soil.

33. Which excretory product is primarily eliminated by the lungs?

A) Urea

B) Carbon dioxide

C) Ammonia

D) Salts

Correct Answer: B) Carbon dioxide

Explanation: The lungs excrete carbon dioxide, a waste product of cellular respiration.

34. What is the primary role of the skeletal system in locomotion?

A) To produce hormones

B) To provide a framework for muscles to act upon

C) To absorb nutrients

D) To store water

Correct Answer: B) To provide a framework for muscles to act upon

Explanation: The skeletal system provides leverage and support, allowing muscles to facilitate movement.

35. Which of the following best describes the function of the flame cell in flatworms?

A) Nutrient absorption

B) Excretion of metabolic waste

C) Gas exchange

D) Circulation of blood

Correct Answer: B) Excretion of metabolic waste

Explanation: Flame cells are specialized structures in flatworms that help in the excretion of metabolic wastes.

36. Which type of joint allows for rotation around a single axis?

A) Hinge joint

B) Ball and socket joint

C) Pivot joint

D) Fixed joint

Correct Answer: C) Pivot joint

Explanation: Pivot joints, such as the neck, allow for rotational movement around a single axis.

37. What is the main excretory product of plants?

A) Carbon dioxide

B) Oxygen

C) Urea

D) Nitrogen

Correct Answer: A) Carbon dioxide

Explanation: Plants excrete carbon dioxide as a byproduct of cellular respiration.

38. How does the structure of bone contribute to its function?

A) It is flexible

B) It is lightweight

C) It is dense and strong

D) It is porous

Correct Answer: C) It is dense and strong

Explanation: The dense and strong structure of bone provides the necessary support and protection for the body.

39. What structure in plants is responsible for gas exchange?

A) Stomata

B) Xylem

C) Phloem

D) Cuticle

Correct Answer: A) Stomata

Explanation: Stomata are small openings on the surface of leaves that facilitate gas exchange during photosynthesis and respiration.

40. Which of the following is a function of the skeletal system?

A) Producing hormones

B) Storing fat

C) Protecting vital organs

D) Absorbing nutrients

Correct Answer: C) Protecting vital organs

Explanation: The skeletal system provides a protective framework for vital organs, such as the heart and lungs.

41. What type of plant movement is caused by a directional stimulus?

A) Nastic movement

B) Tropic movement

C) Tactic movement

D) Random movement

Correct Answer: B) Tropic movement

Explanation: Tropic movements are directional responses to stimuli such as light, gravity, or water.

42. Which tissue provides the strongest support in plants?

A) Parenchyma

B) Collenchyma

C) Sclerenchyma

D) Xylem

Correct Answer: C) Sclerenchyma

Explanation: Sclerenchyma consists of thick-walled cells that provide the most rigid support in plants.

43. What is the function of the synovial fluid in joints?

A) To provide nutrients

B) To lubricate joints

C) To absorb shock

D) To produce blood

Correct Answer: B) To lubricate joints

Explanation: Synovial fluid lubricates joints, reducing friction and allowing for smooth movement.

44. Which type of joint is found in the shoulder?

A) Hinge joint

B) Ball and socket joint

C) Pivot joint

D) Fixed joint

Correct Answer: B) Ball and socket joint

Explanation: The shoulder joint is a ball and socket joint, allowing for a wide range of motion.

45. Which excretory structure is found in annelids?

A) Malpighian tubules

B) Nephridia

C) Flame cells

D) Kidneys

Correct Answer: B) Nephridia

Explanation: Nephridia are excretory structures found in annelids that help in the excretion of waste products.

46. What is the primary function of the trachea in insects?

A) Gas exchange

B) Nutrient absorption

C) Excretion

D) Support

Correct Answer: A) Gas exchange

Explanation: The trachea in insects is responsible for transporting oxygen directly to tissues for respiration.

47. Which hormone is primarily responsible for regulating growth in plants?

A) Ethylene

B) Auxin

C) Gibberellin

D) Cytokinin

Correct Answer: B) Auxin

Explanation: Auxin is the hormone that regulates growth and directional responses in plants.

48. Which of the following structures is involved in excreting water and salts in mammals?

A) Kidneys

B) Stomata

C) Gills

D) Skin

Correct Answer: A) Kidneys

Explanation: Kidneys are the primary organs involved in filtering blood and excreting waste products, including water and salts.

49. How do the lungs contribute to the excretory process?

A) By absorbing nutrients

B) By excreting carbon dioxide

C) By producing hormones

D) By filtering blood

Correct Answer: B) By excreting carbon dioxide

Explanation: The lungs excrete carbon dioxide, a waste product produced during cellular respiration.

50. Which of the following best describes the role of the skeletal system in protection?

A) It absorbs nutrients

B) It supports muscle attachment

C) It protects vital organs from injury

D) It produces blood cells

Correct Answer: C) It protects vital organs from injury

Explanation: The skeletal system acts as a protective barrier for vital organs, such as the brain and heart.

51. Which of the following is a function of the integumentary system?

A) Nutrient absorption

B) Gas exchange

C) Excretion of wastes

D) Hormone production

Correct Answer: C) Excretion of wastes

Explanation: The integumentary system, including the skin, helps in excreting waste products through sweat.

52. What type of joint allows for limited movement?

A) Hinge joint

B) Ball and socket joint

C) Fixed joint

D) Cartilaginous joint

Correct Answer: D) Cartilaginous joint

Explanation: Cartilaginous joints allow for limited movement, providing flexibility while maintaining stability.

53. Which of the following structures is responsible for the excretion of nitrogenous wastes in mammals?

A) Kidneys

B) Liver

C) Lungs

D) Skin

Correct Answer: A) Kidneys

Explanation: The kidneys filter blood to excrete nitrogenous wastes, mainly in the form of urea.

54. What is the role of the skeletal system in mineral storage?

A) To absorb nutrients

B) To store calcium and phosphorus

C) To produce hormones

D) To facilitate gas exchange

Correct Answer: B) To store calcium and phosphorus

Explanation: The skeletal system stores essential minerals like calcium and phosphorus, which are important for various bodily functions.

55. Which type of plant movement is primarily influenced by touch?

A) Tropic movement

B) Nastic movement

C) Tactic movement

D) Random movement

Correct Answer: B) Nastic movement

1. **Reproduction**

1. What is the primary characteristic of asexual reproduction?

A) Involves the fusion of gametes

B) Requires two parents

C) Produces genetically identical offspring

D) Involves complex structures

Correct Answer: C) Produces genetically identical offspring

Explanation: Asexual reproduction results in offspring that are genetically identical to the parent organism, as it does not involve gametes.

2. Which of the following is an example of fission?

A) Yeast budding

B) Paramecium division

C) Strawberry runners

D) Grafting

Correct Answer: B) Paramecium division

Explanation: Fission is a type of asexual reproduction where an organism splits into two or more parts, as seen in Paramecium.

3. What is budding in yeast?

A) A form of sexual reproduction

B) A type of asexual reproduction

C) A method of fertilization

D) A process of gamete fusion

Correct Answer: B) A type of asexual reproduction

Explanation: Budding is an asexual reproduction method where a new organism develops from an outgrowth of the parent.

4. Which of the following is a method of natural vegetative propagation?

A) Grafting

B) Layering

C) Runners

D) Budding

Correct Answer: C) Runners

Explanation: Runners are horizontal stems that produce new plants at nodes, exemplifying natural vegetative propagation.

5. What is the main advantage of sexual reproduction?

A) It is faster than asexual reproduction

B) It produces more offspring

C) It increases genetic diversity

D) It requires less energy

Correct Answer: C) It increases genetic diversity

Explanation: Sexual reproduction combines genetic material from two parents, leading to greater genetic variation in the offspring.

6. Which floral part is primarily responsible for producing pollen?

A) Ovary

B) Stigma

C) Anther

D) Petal

Correct Answer: C) Anther

Explanation: The anther is the part of the stamen that produces and releases pollen, which contains the male gametes.

7. What is the process of pollination?

A) Fusion of gametes

B) Transfer of pollen from anther to stigma

C) Development of the embryo

D) Formation of seeds

Correct Answer: B) Transfer of pollen from anther to stigma

Explanation: Pollination involves the transfer of pollen grains from the male part (anther) to the female part (stigma) of a flower.

8. What is the main product of sexual reproduction in flowering plants?

A) Seeds

B) Roots

C) Leaves

D) Stems

Correct Answer: A) Seeds

Explanation: The primary product of sexual reproduction in flowering plants is seeds, which develop from fertilized ovules.

9. In mammals, what is the main function of the male reproductive organ?

A) To produce eggs

B) To produce sperm

C) To nourish the embryo

D) To facilitate fertilization

Correct Answer: B) To produce sperm

Explanation: The male reproductive organs, including the testes, are primarily responsible for the production of sperm.

10. What is fertilization?

A) The division of cells

B) The fusion of gametes

C) The growth of an embryo

D) The production of eggs

Correct Answer: B) The fusion of gametes

Explanation: Fertilization is the process where male and female gametes fuse to form a zygote.

11. Which of the following is a method of artificial vegetative propagation?

A) Runners

B) Grafting

C) Budding in yeast

D) Fission

Correct Answer: B) Grafting

Explanation: Grafting is a horticultural technique where tissues from one plant are inserted into another to propagate desired traits.

12. What is the significance of cross-pollination?

A) It results in more offspring

B) It increases genetic diversity

C) It is faster than self-pollination

D) It requires less energy

Correct Answer: B) It increases genetic diversity

Explanation: Cross-pollination promotes genetic variation, enhancing a population's adaptability and resilience.

13. What type of placentation is found in a simple fruit?

A) Parietal

B) Axile

C) Free central

D) Basal

Correct Answer: B) Axile

Explanation: Axile placentation occurs when ovules are attached to the central axis of the ovary in a simple fruit.

14. What distinguishes male reproductive organs from female reproductive organs in mammals?

A) Size

B) Function in gamete production

C) Structure

D) All of the above

Correct Answer: D) All of the above

Explanation: Male and female reproductive organs differ in size, structure, and their specific roles in gamete production.

15. What hormone is primarily responsible for regulating the menstrual cycle in females?

A) Insulin

B) Testosterone

C) Estrogen

D) Progesterone

Correct Answer: C) Estrogen

Explanation: Estrogen plays a crucial role in regulating the menstrual cycle and is involved in the development of female secondary sexual characteristics.

16. Which of the following structures is involved in the development of the embryo in mammals?

A) Uterus

B) Ovary

C) Fallopian tube

D) Testes

Correct Answer: A) Uterus

Explanation: The uterus provides a nurturing environment for the development of the embryo during pregnancy.

17. What is the role of the stigma in flowers?

A) To produce pollen

B) To attract pollinators

C) To receive pollen

D) To protect the ovary

Correct Answer: C) To receive pollen

Explanation: The stigma is the part of the pistil that receives pollen during pollination, initiating fertilization.

18. Which of the following best describes the fusion of gametes?

A) Asexual reproduction

B) Fertilization

C) Vegetative propagation

D) Budding

Correct Answer: B) Fertilization

Explanation: The fusion of male and female gametes is known as fertilization, resulting in the formation of a zygote.

19. What is the primary purpose of natural vegetative propagation in agriculture?

A) To increase genetic diversity

B) To produce identical plants

C) To improve soil quality

D) To enhance pollination

Correct Answer: B) To produce identical plants

Explanation: Natural vegetative propagation allows farmers to produce genetically identical plants with desirable traits.

20. Which of the following is a disadvantage of self-pollination?

A) Increased genetic diversity

B) Reduced adaptability

C) Lower seed production

D) Dependence on pollinators

Correct Answer: B) Reduced adaptability

Explanation: Self-pollination can lead to reduced genetic variation, making populations less adaptable to environmental changes.

21. What type of fruit develops from multiple ovaries of a single flower?

A) Simple fruit

B) Aggregate fruit

C) Multiple fruit

D) Accessory fruit

Correct Answer: B) Aggregate fruit

Explanation: Aggregate fruits, such as raspberries, form from multiple ovaries of a single flower.

22. Which part of the flower contains ovules?

A) Stamen

B) Petal

C) Ovary

D) Anther

Correct Answer: C) Ovary

Explanation: The ovary is the part of the flower that contains ovules, which develop into seeds after fertilization.

23. What is the significance of the placenta in mammals?

A) It provides nutrients to the embryo

B) It produces eggs

C) It helps in fertilization

D) It regulates hormones

Correct Answer: A) It provides nutrients to the embryo

Explanation: The placenta facilitates the transfer of nutrients and oxygen from the mother to the developing embryo.

24. Which of the following methods can be used to control reproduction in humans?

A) Grafting

B) In vitro fertilization

C) Budding

D) Fission

Correct Answer: B) In vitro fertilization

Explanation: In vitro fertilization (IVF) is a modern reproductive technology used to assist with conception.

25. What is the primary reproductive organ in males?

A) Ovary

B) Testes

C) Uterus

D) Prostate

Correct Answer: B) Testes

Explanation: The testes are the male reproductive organs responsible for producing sperm and testosterone.

26. What is a major disadvantage of asexual reproduction?

A) Rapid population increase

B) Lack of genetic diversity

C) Simple process

D) Requires only one parent

Correct Answer: B) Lack of genetic diversity

Explanation: Asexual reproduction results in genetically identical offspring, reducing genetic diversity and adaptability.

27. What is the function of the male urethra?

A) To produce sperm

B) To transport sperm and urine

C) To nourish the embryo

D) To produce hormones

Correct Answer: B) To transport sperm and urine

Explanation: The male urethra serves as a conduit for both urine and sperm, exiting the body through the penis.

28. Which of the following is an advantage of sexual reproduction?

A) Requires less energy

B) Produces more offspring

C) Increases genetic variation

D) Faster process

Correct Answer: C) Increases genetic variation

Explanation: Sexual reproduction introduces genetic variation, enhancing adaptability to changing environments.

29. What is the significance of the ovule in flowering plants?

A) It produces pollen

B) It develops into a seed after fertilization

C) It attracts pollinators

D) It protects the flower

Correct Answer: B) It develops into a seed after fertilization

Explanation: The ovule contains the female gamete and develops into a seed once fertilization occurs.

30. Which hormone is involved in the development of male secondary sexual characteristics?

A) Estrogen

B) Progesterone

C) Testosterone

D) Luteinizing hormone

Correct Answer: C) Testosterone

Explanation: Testosterone is responsible for the development of male secondary sexual characteristics, including muscle growth and facial hair.

31. What is the role of the Fallopian tubes in females?

A) To produce eggs

B) To transport eggs to the uterus

C) To nourish the embryo

D) To produce hormones

Correct Answer: B) To transport eggs to the uterus

Explanation: The Fallopian tubes transport eggs from the ovaries to the uterus, where fertilization may occur.

32. Which reproductive process involves the direct transfer of pollen to the stigma?

A) Fertilization

B) Pollination

C) Germination

D) Budding

Correct Answer: B) Pollination

Explanation: Pollination is the process by which pollen is transferred to the stigma of a flower, enabling fertilization.

33. What is the primary advantage of grafting in agriculture?

A) Increased genetic diversity

B) Faster growth

C) Propagation of desired traits

D) Requires less water

Correct Answer: C) Propagation of desired traits

Explanation: Grafting allows farmers to propagate plants with specific desirable traits, enhancing crop quality.

34. What is the term for a fruit that develops from multiple flowers?

A) Simple fruit

B) Aggregate fruit

C) Multiple fruit

D) Accessory fruit

Correct Answer: C) Multiple fruit

Explanation: Multiple fruits develop from the ovaries of several flowers, such as pineapples.

35. Which type of reproduction is characterized by the formation of a zygote?

A) Asexual reproduction

B) Sexual reproduction

C) Budding

D) Fission

Correct Answer: B) Sexual reproduction

Explanation: Sexual reproduction involves the formation of a zygote through the fusion of male and female gametes.

36. Which of the following methods is used to enhance plant reproduction?

A) Fission

B) In vitro fertilization

C) Grafting

D) Budding

Correct Answer: C) Grafting

Explanation: Grafting is a method used to enhance plant reproduction by combining different plant tissues.

37. Which hormone is responsible for stimulating ovulation?

A) Estrogen

B) Luteinizing hormone

C) Progesterone

D) Follicle-stimulating hormone

Correct Answer: B) Luteinizing hormone

Explanation: Luteinizing hormone triggers ovulation in females and stimulates testosterone production in males.

38. What part of the flower develops into the fruit?

A) Stigma

B) Ovary

C) Anther

D) Style

Correct Answer: B) Ovary

Explanation:\*\* The ovary of the flower develops into the fruit after fertilization has occurred.

39. What is the primary role of the placenta during pregnancy?

A) It stores energy

B) It facilitates gas exchange

C) It nourishes the embryo

D) All of the above

Correct Answer: D) All of the above

Explanation: The placenta nourishes the embryo, facilitates gas exchange, and stores nutrients during pregnancy.

40. Which reproductive strategy is characterized by rapid population growth?

A) Sexual reproduction

B) Asexual reproduction

C) Cross-pollination

D) Grafting

Correct Answer: B) Asexual reproduction

Explanation: Asexual reproduction allows for rapid population growth as offspring are produced quickly and without the need for mates.

41. What type of placentation is characterized by ovules attached to the walls of the ovary?

A) Free central

B) Axile

C) Parietal

D) Basal

Correct Answer: C) Parietal

Explanation: In parietal placentation, ovules are attached to the walls of the ovary, typical in some fruits.

42. Which part of the male reproductive system produces sperm?

A) Prostate gland

B) Seminal vesicle

C) Testes

D) Epididymis

Correct Answer: C) Testes

Explanation: The testes are responsible for producing sperm and male hormones, such as testosterone.

43. What is the main disadvantage of vegetative propagation?

A) Requires specific conditions

B) Produces genetically diverse offspring

C) Slower than seed propagation

D) Risk of disease transmission

Correct Answer: D) Risk of disease transmission

Explanation: Vegetative propagation can spread diseases if the parent plant is infected, leading to health issues in the new plants.

44. Which reproductive structure in plants is responsible for producing ovules?

A) Anther

B) Stigma

C) Ovary

D) Filament

Correct Answer: C) Ovary

Explanation: The ovary contains ovules, which can develop into seeds after fertilization.

45. Which hormone helps maintain pregnancy in females?

A) Estrogen

B) Progesterone

C) Testosterone

D) Luteinizing hormone

Correct Answer: B) Progesterone

Explanation: Progesterone helps maintain the uterine lining and supports pregnancy.

46. What is the primary function of the female reproductive organ?

A) To produce sperm

B) To produce eggs

C) To nourish the embryo

D) To transport sperm

Correct Answer: B) To produce eggs

Explanation: The primary function of the female reproductive organs, including the ovaries, is to produce eggs (ova).

47. What is a common method of artificial vegetative propagation?

A) Runners

B) Grafting

C) Fission

D) Budding

Correct Answer: B) Grafting

Explanation: Grafting is a common method used in agriculture to propagate plants with desirable traits.

48. Which of the following can result from fertilization?

A) Formation of a zygote

B) Development of an embryo

C) Production of seeds

D) All of the above

Correct Answer: D) All of the above

Explanation: Fertilization results in the formation of a zygote, which develops into an embryo and can produce seeds.

49. What is the primary purpose of the stigma in the flower?

A) To produce pollen

B) To receive pollen

C) To protect the ovary

D) To attract pollinators

Correct Answer: B) To receive pollen

Explanation:\*\* The stigma is the part of the pistil that receives pollen during the process of pollination.

50. What is the role of the prostate gland in males?

A) To produce eggs

B) To store sperm

C) To secrete fluid that nourishes sperm

D) To produce testosterone

Correct Answer: C) To secrete fluid that nourishes sperm

Explanation: The prostate gland produces a fluid that nourishes and helps transport sperm during ejaculation.

51. What type of fruit develops from a single ovary?

A) Simple fruit

B) Aggregate fruit

C) Multiple fruit

D) Accessory fruit

Correct Answer: A) Simple fruit

Explanation: Simple fruits develop from a single ovary and can be either fleshy or dry.

52. Which reproductive structure is responsible for the male gamete in flowering plants?

A) Ovary

B) Anther

C) Stigma

D) Petal

Correct Answer: B) Anther

Explanation: The anther is where pollen grains, which contain male gametes, are produced in flowering plants.

53. What is the primary advantage of sexual reproduction in plants?

A) Faster growth

B) Increased genetic variation

C) No need for pollinators

D) Simplicity

Correct Answer: B) Increased genetic variation

Explanation: Sexual reproduction increases genetic variation, helping plants adapt to changing environments.

54. Which part of the female reproductive system is responsible for the site of fertilization?

A) Ovaries

B) Uterus

C) Fallopian tubes

D) Vagina

Correct Answer: C) Fallopian tubes

Explanation: Fertilization typically occurs in the Fallopian tubes, where the sperm meets the egg.

55. What is the term for the process of transferring pollen from one flower to another?

A) Germination

B) Pollination

C) Fertilization

D) Seed dispersal

Correct Answer: B) Pollination

Explanation: Pollination is the transfer of pollen from the anther of one flower to the stigma of another flower.

1. **Growth.**

1. What is the primary definition of growth in biological terms?

A) Increase in size or number of cells

B) Development of new species

C) Change in color

D) Decrease in weight

Correct Answer: A) Increase in size or number of cells

Explanation: Growth in biology refers to the increase in size or number of cells in an organism.

2. What is germination?

A) The process of seed formation

B) The growth of a seed into a new plant

C) The decay of seeds

D) The process of photosynthesis

Correct Answer: B) The growth of a seed into a new plant

Explanation: Germination is the process by which a seed develops into a new plant.

3. Which of the following conditions is NOT necessary for seed germination?

A) Water

B) Oxygen

C) Light

D) Suitable temperature

Correct Answer: C) Light

Explanation: While light can be beneficial for some seeds, it is not a universal requirement for germination.

4. What is epigeal germination?

A) Germination where the cotyledons remain below the soil

B) Germination where the cotyledons emerge above the soil

C) Germination without seed coverings

D) Germination in aquatic environments

Correct Answer: B) Germination where the cotyledons emerge above the soil

Explanation: In epigeal germination, the cotyledons rise above the soil as the seedling grows.

5. What is hypogeal germination?

A) Germination where the cotyledons remain below the soil

B) Germination where the cotyledons emerge above the soil

C) Germination in dry conditions

D) Germination in cold temperatures

Correct Answer: A) Germination where the cotyledons remain below the soil

Explanation: In hypogeal germination, the cotyledons remain underground while the shoot emerges above.

6. Which of the following is a necessary condition for seed germination?

A) High salinity

B) Adequate moisture

C) Excessive cold

D) Total darkness

Correct Answer: B) Adequate moisture

Explanation: Adequate moisture is vital for seed germination, as it activates enzymes and softens the seed coat.

7. How does temperature affect seed germination?

A) It has no effect

B) It only affects the seed coat

C) It can speed up or slow down germination

D) It is the only factor that matters

Correct Answer: C) It can speed up or slow down germination

Explanation: Optimal temperatures can enhance germination rates, while extreme temperatures can inhibit the process.

8. Which part of the seed supplies nutrients during germination?

A) Cotyledon

B) Seed coat

C) Endosperm

D) Embryo

Correct Answer: C) Endosperm

Explanation: The endosperm provides nutrients to the developing embryo during germination.

9. In what conditions do seeds typically germinate best?

A) Dry and warm

B) Wet and cool

C) Warm and moist

D) Cold and dark

Correct Answer: C) Warm and moist

Explanation: Seeds generally germinate best in warm and moist conditions, which promote enzyme activity and growth.

10. What triggers the process of germination in seeds?

A) Exposure to light

B) Water absorption

C) Exposure to air

D) Cold temperatures

Correct Answer: B) Water absorption

Explanation: Water absorption activates metabolic processes in the seed, triggering germination.

11. What is the role of oxygen in seed germination?

A) It is not required

B) It helps in photosynthesis

C) It is essential for respiration

D) It prevents fungal growth

Correct Answer: C) It is essential for respiration

Explanation: Oxygen is necessary for cellular respiration, which provides energy for the germinating seed.

12. Which of the following statements is true about epigeal germination?

A) The seed remains underground

B) The cotyledons are exposed to sunlight

C) It is common in all plant species

D) The seed coat does not split

Correct Answer: B) The cotyledons are exposed to sunlight

Explanation: In epigeal germination, the cotyledons emerge above the soil and are exposed to sunlight.

13. What is the significance of cotyledons in germination?

A) They provide structural support

B) They store nutrients for the seedling

C) They protect the seed

D) They aid in photosynthesis

Correct Answer: B) They store nutrients for the seedling

Explanation: Cotyledons provide stored nutrients to support the seedling during early growth.

14. Which of the following factors can inhibit seed germination?

A) Adequate water

B) Oxygen deficiency

C) Optimal temperature

D) Light exposure

Correct Answer: B) Oxygen deficiency

Explanation: Lack of oxygen can inhibit respiration in seeds, preventing germination.

15. What happens during the process of imbibition in seeds?

A) Seeds absorb water

B) Seeds lose moisture

C) Seeds undergo photosynthesis

D) Seeds produce flowers

Correct Answer: A) Seeds absorb water

Explanation: Imbibition is the process by which seeds absorb water, swelling and softening the seed coat.

16. What is the primary purpose of germination?

A) To produce more seeds

B) To establish a new plant

C) To store nutrients

D) To attract pollinators

Correct Answer: B) To establish a new plant

Explanation: The primary purpose of germination is to enable the seed to develop into a new plant.

17. How does soil type affect seed germination?

A) It has no effect

B) It determines nutrient availability

C) It influences moisture retention

D) All of the above

Correct Answer: D) All of the above

Explanation: Soil type affects nutrient availability, moisture retention, and aeration, all of which influence germination.

18. Which of the following is an example of a plant that exhibits hypogeal germination?

A) Sunflower

B) Bean

C) Pea

D) Cotton

Correct Answer: C) Pea

Explanation: Peas are an example of plants that exhibit hypogeal germination, where the cotyledons remain underground.

19. Why is light not always necessary for seed germination?

A) Some seeds germinate in darkness

B) Light can inhibit germination

C) All seeds require darkness

D) Light has no effect on growth

Correct Answer: A) Some seeds germinate in darkness

Explanation: Some seeds have adaptations that allow them to germinate without light, relying on internal food stores.

20. What role does the seed coat play during germination?

A) It stores nutrients

B) It protects the seed

C) It aids in photosynthesis

D) It absorbs water

Correct Answer: B) It protects the seed

Explanation: The seed coat serves as a protective barrier against physical damage and pathogens during germination.

21. What is the effect of high salinity on seed germination?

A) It promotes germination

B) It has no effect

C) It inhibits germination

D) It speeds up germination

Correct Answer: C) It inhibits germination

Explanation: High salinity can create osmotic pressure that inhibits water uptake, preventing germination.

22. Which of the following is a common method to test seed viability?

A) Soaking seeds in water

B) Germination test

C) Counting the seeds

D) Weighing the seeds

Correct Answer: B) Germination test

Explanation: A germination test evaluates the percentage of seeds that successfully germinate under controlled conditions.

23. How does the presence of hormones affect seed germination?

A) Hormones have no effect

B) They can inhibit germination

C) They promote and regulate germination

D) They only affect embryo growth

Correct Answer: C) They promote and regulate germination

Explanation: Plant hormones, such as gibberellins, promote and regulate the germination process.

24. What is the initial energy source for a germinating seed?

A) Sunlight

B) Stored food in the seed

C) Soil nutrients

D) Water

Correct Answer: B) Stored food in the seed

Explanation: The initial energy source for a germinating seed comes from stored food reserves within the seed.

25. Which of the following is an example of a seed that exhibits epigeal germination?

A) Pea

B) Bean

C) Corn

D) Wheat

Correct Answer: B) Bean

Explanation: Beans exhibit epigeal germination, where the cotyledons rise above the soil during growth.

26. What is the role of temperature in seed germination?

A) It has no effect

B) It influences enzyme activity

C) It only affects moisture levels

D) It is only important for flowering

Correct Answer: B) It influences enzyme activity

Explanation: Temperature affects enzyme activity, which is crucial for metabolic processes during germination.

27. What is the first visible sign of germination?

A) Flowering

B) Seed coat splitting

C) Leaf emergence

D) Root development

Correct Answer: B) Seed coat splitting

Explanation: The first visible sign of germination is typically the splitting of the seed coat, allowing the embryo to emerge.

28. How does overwatering affect seed germination?

A) It promotes faster growth

B) It can lead to rot and inhibit germination

C) It has no effect

D) It helps seeds absorb nutrients

Correct Answer: B) It can lead to rot and inhibit germination

Explanation: Overwatering can cause seeds to rot, preventing successful germination.

29. What is the main function of the radicle in a germinating seed?

A) To absorb nutrients

B) To anchor the plant

C) To produce leaves

D) To form flowers

Correct Answer: B) To anchor the plant

Explanation: The radicle is the embryonic root that anchors the plant and begins to absorb water and nutrients.

30. What is the significance of seed dormancy?

A) It prolongs the germination process

B) It allows seeds to germinate immediately

C) It prevents germination under unfavorable conditions

D) It increases nutrient absorption

Correct Answer: C) It prevents germination under unfavorable conditions

Explanation: Seed dormancy allows seeds to remain inactive until conditions are favorable for germination.

31. Which environmental factor can break seed dormancy?

A) Cold temperatures

B) Water

C) Light

D) All of the above

Correct Answer: D) All of the above

Explanation: Various environmental factors, including cold, water, and light, can trigger the breaking of seed dormancy.

32. How does germination differ in aquatic plants?

A) It requires less water

B) Seeds do not germinate in water

C) Germination occurs underwater

D) It is faster than terrestrial germination

Correct Answer: C) Germination occurs underwater

Explanation: Some aquatic plants have seeds that germinate while submerged in water.

33. What is the importance of the hypocotyl in epigeal germination?

A) It stores nutrients

B) It absorbs water

C) It elevates the cotyledons above the soil

D) It produces flowers

Correct Answer: C) It elevates the cotyledons above the soil

Explanation: The hypocotyl elongates to lift the cotyledons above the soil in epigeal germination.

34. Which of the following conditions is optimal for seed germination?

A) Dry and cold

B) Warm and moist

C) Hot and dry

D) Cold and wet

Correct Answer: B) Warm and moist

Explanation: Warm and moist conditions are generally optimal for seed germination, promoting growth.

35. What is the role of enzymes during seed germination?

A) They inhibit growth

B) They break down stored nutrients

C) They produce chlorophyll

D) They protect the seed

Correct Answer: B) They break down stored nutrients

Explanation: Enzymes activate during germination to break down stored nutrients, providing energy for growth.

36. How does the seed coat affect germination?

A) It has no effect

B) It protects the seed from damage

C) It promotes rapid growth

D) It absorbs water

Correct Answer: B) It protects the seed from damage

Explanation: The seed coat protects the seed from physical damage and pathogens until conditions are right for germination.

37. What is the primary function of the endosperm during germination?

A) To protect the seed

B) To provide nutrients to the embryo

C) To absorb water

D) To form roots

Correct Answer: B) To provide nutrients to the embryo

Explanation: The endosperm serves as a food reserve for the developing embryo during germination.

38. Why is seed viability important in agriculture?

A) It determines the color of the plant

B) It affects the rate of photosynthesis

C) It influences crop yield and quality

D) It has no effect on plant growth

Correct Answer: C) It influences crop yield and quality

Explanation: Seed viability is critical for ensuring high germination rates, which directly impact crop yield and quality.

39. What type of germination occurs in maize?

A) Epigeal

B) Hypogeal

C) Aquatic

D) Dormant

Correct Answer: B) Hypogeal

Explanation: Maize exhibits hypogeal germination, where the cotyledons remain below the soil.

40. How do environmental conditions during germination affect plant growth?

A) They have no effect

B) They can enhance or hinder growth

C) They only affect seed color

D) They are irrelevant after germination

Correct Answer: B) They can enhance or hinder growth

Explanation: Environmental conditions such as moisture, temperature, and light significantly influence growth rates and success.

41. What is the effect of light on seed germination?

A) It is always necessary

B) It can inhibit germination

C) It has no effect

D) It only affects flowering

Correct Answer: B) It can inhibit germination

Explanation: For some seeds, exposure to light can inhibit germination, while others require light to germinate.

42. What is the primary method to enhance seed germination in agriculture?

A) Using fertilizers

B) Soaking seeds in water

C) Exposing seeds to sunlight

D) Planting in dry soil

Correct Answer: B) Soaking seeds in water

Explanation: Soaking seeds in water before planting can enhance germination by promoting imbibition.

43. How does humidity affect seed germination?

A) It has no effect

B) High humidity is detrimental

C) Low humidity promotes germination

D) High humidity can promote germination

Correct Answer: D) High humidity can promote germination

Explanation: High humidity helps maintain moisture levels necessary for germination.

44. What is the role of gibberellins in seed germination?

A) They inhibit growth

B) They promote germination

C) They protect seeds

D) They store nutrients

Correct Answer: B) They promote germination

Explanation: Gibberellins are plant hormones that promote seed germination and growth.

45. What is the importance of seed dispersal?

A) It prevents overcrowding

B) It enhances germination

C) It increases disease spread

D) It has no importance

Correct Answer: A) It prevents overcrowding

Explanation: Seed dispersal prevents overcrowding of plants and allows colonization of new areas.

46. Which of the following seeds is likely to germinate faster?

A) Old seeds

B) Dormant seeds

C) Fresh seeds

D) Dehydrated seeds

Correct Answer: C) Fresh seeds

Explanation: Fresh seeds typically have higher viability and germinate faster than old or dormant seeds.

47. Which type of seed dormancy requires specific environmental triggers to germinate?

A) Physiological dormancy

B) Morphological dormancy

C) Seed coat dormancy

D) None of the above

Correct Answer: A) Physiological dormancy

Explanation: Physiological dormancy requires specific environmental conditions, such as temperature or moisture, to break dormancy.

48. What is the effect of planting depth on seed germination?

A) It has no effect

B) Deeper planting always results in better germination

C) Different seeds require different planting depths

D) Shallower planting is always better

Correct Answer: C) Different seeds require different planting depths

Explanation: Different seeds have specific depth requirements for optimal germination.

49. What is the significance of root development during germination?

A) It anchors the plant

B) It absorbs nutrients

C) It stabilizes the plant

D) All of the above

Correct Answer: D) All of the above

Explanation:\*\* Root development is crucial for anchoring the plant, stabilizing it, and absorbing water and nutrients.

50. How do plants ensure seed germination occurs at the right time?

A) By relying on animal dispersers

B) Through seed dormancy mechanisms

C) By producing more seeds

D) By using light for energy

Correct Answer: B) Through seed dormancy mechanisms

Explanation: Seed dormancy mechanisms ensure that seeds germinate only under favorable conditions.

51. What environmental factor can trigger the germination of some desert seeds?

A) High humidity

B) Rainfall

C) Extreme heat

D) Cold temperatures

Correct Answer: B) Rainfall

Explanation: Rainfall can trigger the germination of some desert seeds that have adapted to respond to moisture.

52. What is the primary purpose of seed reserves during germination?

A) To provide energy for the seedling

B) To protect the seed

C) To attract pollinators

D) To store water

Correct Answer: A) To provide energy for the seedling

Explanation: Seed reserves provide essential energy for the seedling's growth until it can photosynthesize.

1. **Co-ordination and control.**

1. What is the primary function of the central nervous system (CNS)?

A) To control voluntary movements

B) To process information and coordinate responses

C) To transmit impulses to muscles

D) To detect sensory stimuli

Correct Answer: B) To process information and coordinate responses

Explanation: The CNS, consisting of the brain and spinal cord, processes information and coordinates responses to stimuli.

2. What are the main components of the peripheral nervous system (PNS)?

A) Brain and spinal cord

B) Nerves and ganglia

C) Muscles and glands

D) Neurons and synapses

Correct Answer: B) Nerves and ganglia

Explanation: The PNS consists of all the nerves and ganglia outside the CNS, connecting it to the rest of the body.

3. How do nerve impulses transmit across a synapse?

A) By direct contact

B) Via neurotransmitters

C) By electrical signals

D) Through blood circulation

Correct Answer: B) Via neurotransmitters

Explanation: Nerve impulses are transmitted across synapses by the release of neurotransmitters, which cross the synaptic gap.

4. What is reflex action?

A) A deliberate response

B) An automatic, rapid response to a stimulus

C) A learned behavior

D) A voluntary action

Correct Answer: B) An automatic, rapid response to a stimulus

Explanation: Reflex actions are quick, involuntary responses to stimuli, bypassing conscious control.

### 5. Which sense organ is primarily responsible for detecting touch?

A) Nose

B) Eye

C) Skin

D) Ear

\*\*Correct Answer: C) Skin\*\*

\*\*Explanation:\*\* The skin contains tactile receptors that detect touch, pressure, and temperature.

### 6. What is the function of the olfactory receptors in the nose?

A) To detect sound

B) To detect light

C) To detect smells

D) To detect taste

\*\*Correct Answer: C) To detect smells\*\*

\*\*Explanation:\*\* Olfactory receptors in the nose are specialized for detecting odors and enabling the sense of smell.

### 7. What is the primary role of taste buds on the tongue?

A) To detect temperature

B) To detect sound

C) To detect flavors

D) To detect light

\*\*Correct Answer: C) To detect flavors\*\*

\*\*Explanation:\*\* Taste buds on the tongue are responsible for detecting different tastes, such as sweet, sour, salty, and bitter.

### 8. Which part of the eye is responsible for focusing light?

A) Cornea

B) Retina

C) Lens

D) Iris

\*\*Correct Answer: C) Lens\*\*

\*\*Explanation:\*\* The lens of the eye adjusts its shape to focus light onto the retina, allowing for clear vision.

### 9. What is the function of the auditory system in the ear?

A) To detect light

B) To detect sounds

C) To detect smells

D) To detect tastes

\*\*Correct Answer: B) To detect sounds\*\*

\*\*Explanation:\*\* The auditory system in the ear is responsible for detecting sound waves and converting them into nerve impulses.

### 10. Which gland is known as the "master gland" of the endocrine system?

A) Thyroid gland

B) Pituitary gland

C) Adrenal gland

D) Pancreas

\*\*Correct Answer: B) Pituitary gland\*\*

\*\*Explanation:\*\* The pituitary gland is often referred to as the master gland because it regulates other endocrine glands and various bodily functions.

### 11. What hormone is produced by the thyroid gland?

A) Insulin

B) Thyroxine

C) Adrenaline

D) Estrogen

\*\*Correct Answer: B) Thyroxine\*\*

\*\*Explanation:\*\* The thyroid gland produces thyroxine, which regulates metabolism and energy levels.

### 12. What is the role of parathyroid hormone?

A) To regulate blood sugar levels

B) To regulate calcium levels in the blood

C) To regulate metabolism

D) To stimulate growth

\*\*Correct Answer: B) To regulate calcium levels in the blood\*\*

\*\*Explanation:\*\* Parathyroid hormone regulates calcium levels in the blood, maintaining bone health and metabolic functions.

### 13. Which gland produces adrenaline?

A) Thyroid gland

B) Adrenal gland

C) Pancreas

D) Pituitary gland

\*\*Correct Answer: B) Adrenal gland\*\*

\*\*Explanation:\*\* The adrenal glands produce adrenaline, which is involved in the fight-or-flight response.

### 14. What hormone is secreted by the pancreas to lower blood sugar levels?

A) Glucagon

B) Insulin

C) Adrenaline

D) Cortisol

\*\*Correct Answer: B) Insulin\*\*

\*\*Explanation:\*\* Insulin is produced by the pancreas to lower blood sugar levels by facilitating the uptake of glucose into cells.

### 15. What is the function of gonadal hormones?

A) To regulate metabolism

B) To control reproductive functions

C) To regulate stress response

D) To maintain calcium balance

\*\*Correct Answer: B) To control reproductive functions\*\*

\*\*Explanation:\*\* Gonadal hormones, such as estrogen and testosterone, regulate sexual development and reproductive functions.

### 16. Which plant hormone is responsible for promoting cell elongation?

A) Ethylene

B) Auxin

C) Gibberellin

D) Cytokinin

\*\*Correct Answer: B) Auxin\*\*

\*\*Explanation:\*\* Auxin promotes cell elongation and is involved in various growth responses in plants.

### 17. What is the function of gibberellins in plants?

A) To promote fruit ripening

B) To stimulate flowering

C) To regulate cell division

D) To promote seed germination and elongation

\*\*Correct Answer: D) To promote seed germination and elongation\*\*

\*\*Explanation:\*\* Gibberellins stimulate seed germination and promote stem elongation in plants.

### 18. What is the effect of cytokinins in plants?

A) They promote leaf abscission

B) They delay aging and promote cell division

C) They inhibit growth

D) They promote fruit ripening

\*\*Correct Answer: B) They delay aging and promote cell division\*\*

\*\*Explanation:\*\* Cytokinins promote cell division and delay aging in plant tissues.

### 19. What is the role of ethylene in plants?

A) To promote growth

B) To stimulate flowering

C) To promote fruit ripening

D) To inhibit root growth

\*\*Correct Answer: C) To promote fruit ripening\*\*

\*\*Explanation:\*\* Ethylene is a plant hormone that regulates fruit ripening and can influence the aging process.

### 20. How do hormones contribute to homeostasis?

A) By causing diseases

B) By regulating physiological processes

C) By promoting uncontrolled growth

D) By inhibiting all functions

\*\*Correct Answer: B) By regulating physiological processes\*\*

\*\*Explanation:\*\* Hormones play a critical role in maintaining homeostasis by regulating various physiological processes in the body.

### 21. What is the primary function of the hypothalamus in the endocrine system?

A) To produce insulin

B) To regulate body temperature and hormone release

C) To stimulate growth

D) To control blood pressure

\*\*Correct Answer: B) To regulate body temperature and hormone release\*\*

\*\*Explanation:\*\* The hypothalamus regulates temperature and controls the release of hormones from the pituitary gland.

### 22. Which part of the brain is responsible for coordinating reflex actions?

A) Cerebrum

B) Cerebellum

C) Brainstem

D) Hypothalamus

\*\*Correct Answer: C) Brainstem\*\*

\*\*Explanation:\*\* The brainstem coordinates reflex actions and controls basic life functions.

### 23. How does a reflex action differ from a voluntary action?

A) Reflex actions are slower

B) Reflex actions require conscious thought

C) Reflex actions are automatic responses

D) Reflex actions involve more than one synapse

\*\*Correct Answer: C) Reflex actions are automatic responses\*\*

\*\*Explanation:\*\* Reflex actions are automatic and do not require conscious thought, while voluntary actions are consciously controlled.

### 24. What is a conditioned reflex?

A) A reflex that occurs without practice

B) A learned response to a specific stimulus

C) A reflex that is always the same

D) A reflex that requires no stimuli

\*\*Correct Answer: B) A learned response to a specific stimulus\*\*

\*\*Explanation:\*\* A conditioned reflex is a learned response that occurs when a neutral stimulus is associated with a significant stimulus.

### 25. Which of the following is an example of a reflex action?

A) Writing

B) Riding a bicycle

C) Blinking when something approaches the eyes

D) Studying

\*\*Correct Answer: C) Blinking when something approaches the eyes\*\*

\*\*Explanation:\*\* Blinking is a reflex action that occurs automatically in response to a stimulus.

### 26. What is the role of sensory neurons?

A) To transmit impulses from the brain to muscles

B) To transmit impulses from the spinal cord to the brain

C) To transmit impulses from sense organs to the CNS

D) To process information in the brain

\*\*Correct Answer: C) To transmit impulses from sense organs to the CNS\*\*

\*\*Explanation:\*\* Sensory neurons carry information from sensory receptors to the central nervous system.

### 27. Which structure in the eye is responsible for light detection?

A) Retina

B) Cornea

C) Lens

D) Iris

\*\*Correct Answer: A) Retina\*\*

\*\*Explanation:\*\* The retina contains photoreceptors that detect light and convert it into nerve impulses.

### 28. What is the primary function of the adrenal cortex?

A) To produce adrenaline

B) To produce cortisol and aldosterone

C) To regulate blood sugar

D) To control growth

\*\*Correct Answer: B) To produce cortisol and aldosterone\*\*

\*\*Explanation:\*\* The adrenal cortex produces hormones like cortisol and aldosterone, which regulate metabolism and blood pressure.

### 29. What role does the pancreas play in hormone regulation?

A) It only produces insulin

B) It regulates blood sugar levels

C) It controls growth and development

D) It has no hormonal function

\*\*Correct Answer: B) It regulates blood sugar levels\*\*

\*\*Explanation:\*\* The pancreas produces insulin and glucagon to regulate blood sugar levels in the body.

### 30. Which part of the brain is involved in processing visual information?

A) Cerebrum

B) Cerebellum

C) Brainstem

D) Hypothalamus

\*\*Correct Answer: A) Cerebrum\*\*

\*\*Explanation:\*\* The cerebrum is responsible for processing sensory information, including visual input.

### 31. What is the primary function of the somatic nervous system?

A) To control involuntary actions

B) To regulate hormone levels

C) To control voluntary movements

D) To process sensory information

\*\*Correct Answer: C) To control voluntary movements\*\*

\*\*Explanation:\*\* The somatic nervous system controls voluntary movements by transmitting signals from the CNS to skeletal muscles.

### 32. How does the body maintain homeostasis?

A) By ignoring external changes

B) By using feedback mechanisms

C) By increasing energy expenditure

D) By shutting down non-essential functions

\*\*Correct Answer: B) By using feedback mechanisms\*\*

\*\*Explanation:\*\* The body maintains homeostasis through feedback mechanisms that regulate physiological processes.

### 33. Which hormone is responsible for increasing blood sugar levels?

A) Insulin

B) Glucagon

C) Cortisol

D) Thyroxine

\*\*Correct Answer: B) Glucagon\*\*

\*\*Explanation:\*\* Glucagon raises blood sugar levels by promoting the conversion of glycogen to glucose in the liver.

### 34. What is the role of the hypothalamus in temperature regulation?

A) It produces insulin

B) It detects changes in body temperature and initiates responses

C) It regulates blood pressure

D) It stimulates muscle contraction

\*\*Correct Answer: B) It detects changes in body temperature and initiates responses\*\*

\*\*Explanation:\*\* The hypothalamus monitors body temperature and triggers mechanisms to maintain homeostasis.

### 35. Which hormone is involved in the fight-or-flight response?

A) Insulin

B) Adrenaline

C) Estrogen

D) Testosterone

\*\*Correct Answer: B) Adrenaline\*\*

\*\*Explanation:\*\* Adrenaline prepares the body for a fight-or-flight response by increasing heart rate and energy availability.

### 36. What is the primary effect of auxins in plants?

A) Promote fruit ripening

B) Stimulate cell elongation and growth

C) Inhibit leaf abscission

D) Regulate flowering

\*\*Correct Answer: B) Stimulate cell elongation and growth\*\*

\*\*Explanation:\*\* Auxins promote cell elongation, which is essential for plant growth and development.

### 37. How do cytokinin hormones affect plant growth?

A) They promote leaf dropping

B) They stimulate root growth

C) They promote cell division and delay aging

D) They inhibit flowering

\*\*Correct Answer: C) They promote cell division and delay aging\*\*

\*\*Explanation:\*\* Cytokinins promote cell division and can delay the aging process in plant tissues.

### 38. Which plant hormone is responsible for leaf abscission?

A) Auxin

B) Ethylene

C) Gibberellin

D) Cytokinin

\*\*Correct Answer: B) Ethylene\*\*

\*\*Explanation:\*\* Ethylene is involved in the process of leaf abscission, where leaves detach from the plant.

### 39. What hormone is secreted by the pituitary gland to stimulate growth?

A) Thyroxine

B) Growth hormone

C) Insulin

D) Cortisol

\*\*Correct Answer: B) Growth hormone\*\*

\*\*Explanation:\*\* The pituitary gland secretes growth hormone, which stimulates growth and cell reproduction.

### 40. How do hormones contribute to the regulation of metabolism?

A) By decreasing energy production

B) By influencing enzymatic reactions

C) By blocking nutrient absorption

D) By promoting cell death

\*\*Correct Answer: B) By influencing enzymatic reactions\*\*

\*\*Explanation:\*\* Hormones regulate metabolism by influencing enzymatic reactions involved in energy production and utilization.

### 41. Which part of the ear is responsible for balance?

A) Cochlea

B) Auditory canal

C) Semicircular canals

D) Eardrum

\*\*Correct Answer: C) Semicircular canals\*\*

\*\*Explanation:\*\* The semicircular canals in the inner ear are responsible for maintaining balance and spatial orientation.

### 42. What is the role of the cerebellum?

A) To process visual information

B) To coordinate voluntary movements and maintain balance

C) To regulate hormone secretion

D) To control reflex actions

\*\*Correct Answer: B) To coordinate voluntary movements and maintain balance\*\*

\*\*Explanation:\*\* The cerebellum is involved in coordinating muscle movements and maintaining balance.

### 43. What is the function of the spinal cord in the nervous system?

A) To process sensory information

B) To transmit signals between the brain and the rest of the body

C) To produce hormones

D) To detect environmental changes

\*\*Correct Answer: B) To transmit signals between the brain and the rest of the body\*\*

\*\*Explanation:\*\* The spinal cord acts as a communication pathway between the brain and the peripheral nervous system.

### 44. Which endocrine gland regulates the body's metabolic rate?

A) Adrenal gland

B) Pancreas

C) Thyroid gland

D) Pituitary gland

\*\*Correct Answer: C) Thyroid gland\*\*

\*\*Explanation:\*\* The thyroid gland regulates the metabolic rate through the secretion of thyroxine.

### 45. How is the knee-jerk reflex initiated?

A) By sensory input from the eyes

B) By tapping the patellar tendon

C) By conscious thought

D) By muscle fatigue

\*\*Correct Answer: B) By tapping the patellar tendon\*\*

\*\*Explanation:\*\* Tapping the patellar tendon stretches the muscle, initiating the knee-jerk reflex.

### 46. What is the role of the retina in vision?

A) To focus light

B) To detect light and convert it to nerve impulses

C) To regulate eye movement

D) To produce tears

\*\*Correct Answer: B) To detect light and convert it to nerve impulses\*\*

\*\*Explanation:\*\* The retina contains photoreceptors that detect light and convert it into electrical signals for the brain to interpret.

### 47. What is the effect of auxins on plant tropisms?

A) They inhibit growth

B) They promote growth toward light and away from gravity

C) They have no effect

D) They only affect root growth

\*\*Correct Answer: B) They promote growth toward light and away from gravity\*\*

\*\*Explanation:\*\* Auxins promote plant growth in response to light (phototropism) and gravity (gravitropism).

### 48. Which hormone helps regulate water balance in the body?

A) Adrenaline

B) Aldosterone

C) Insulin

D) Thyroxine

\*\*Correct Answer: B) Aldosterone\*\*

\*\*Explanation:\*\* Aldosterone regulates sodium and potassium levels, influencing water balance in the body.

### 49. What type of reflex is the salivation response when smelling food?

A) Unconditioned reflex

B) Conditioned reflex

C) Voluntary action

D) Involuntary action

\*\*Correct Answer: B) Conditioned reflex\*\*

\*\*Explanation:\*\* Salivation in response to the smell of food is a conditioned reflex that occurs through association.

### 50. How does adrenaline affect the body during stress?

A) Increases metabolism

B) Slows down heart rate

C) Promotes relaxation

D) Decreases blood sugar levels

\*\*Correct Answer: A) Increases metabolism\*\*

\*\*Explanation:\*\* Adrenaline increases metabolism, heart rate, and energy availability during stressful situations.

### 51. What occurs during the knee-jerk reflex?

A) The brain is involved in the response

B) The response is delayed

C) The spinal cord mediates the response

D) It is a voluntary action

\*\*Correct Answer: C) The spinal cord mediates the response\*\*

\*\*Explanation:\*\* The knee-jerk reflex is an automatic response mediated by the spinal cord without involving the brain.

### 52. Which hormone regulates the sleep-wake cycle?

A) Cortisol

B) Melatonin

C) Insulin

D) Adrenaline

\*\*Correct Answer: B) Melatonin\*\*

\*\*Explanation:\*\* Melatonin regulates the sleep-wake cycle by promoting sleepiness in response to darkness.

### 53. How do sensory receptors function?

A) By transmitting impulses to muscles

B) By detecting environmental stimuli

C) By processing information in the brain

D) By releasing hormones

\*\*Correct Answer: B) By detecting environmental stimuli\*\*

\*\*Explanation:\*\* Sensory receptors detect environmental stimuli and convert them into nerve impulses for processing.

### 54. What is the primary function of hormones in the body?

A) To provide energy

B) To facilitate communication between cells and regulate physiological processes

C) To protect against pathogens

D) To form structural components

\*\*Correct Answer: B) To facilitate communication between cells and regulate physiological processes\*\*

**C:Ecology**

1. **Factors affecting the distribution of Organisms**

### 1. What is an abiotic factor?

A) A living component of an ecosystem

B) A non-living component of an ecosystem

C) A biotic interaction

D) A chemical process

\*\*Correct Answer: B) A non-living component of an ecosystem\*\*

\*\*Explanation:\*\* Abiotic factors include non-living elements such as temperature, water, and soil.

### 2. Which of the following is an example of a biotic factor?

A) Temperature

B) Soil pH

C) Competition between species

D) Wind speed

\*\*Correct Answer: C) Competition between species\*\*

\*\*Explanation:\*\* Biotic factors involve interactions among living organisms, such as competition for resources.

### 3. How does temperature affect the distribution of organisms?

A) It has no effect

B) It influences metabolic rates and growth

C) It only affects plants

D) It only affects animals

\*\*Correct Answer: B) It influences metabolic rates and growth\*\*

\*\*Explanation:\*\* Temperature affects the metabolic rates, reproduction, and survival of organisms, influencing their distribution.

### 4. What role does rainfall play in the distribution of organisms?

A) It has no significant impact

B) It determines soil type

C) It affects water availability for plants and animals

D) It only affects aquatic organisms

\*\*Correct Answer: C) It affects water availability for plants and animals\*\*

\*\*Explanation:\*\* Rainfall influences the availability of water, which is crucial for the survival of all organisms.

### 5. How does relative humidity impact organism distribution?

A) It affects only aquatic organisms

B) It influences transpiration and evaporation

C) It has no impact on land organisms

D) It only affects temperature

\*\*Correct Answer: B) It influences transpiration and evaporation\*\*

\*\*Explanation:\*\* Relative humidity affects water loss in plants and animals, influencing their distribution and survival.

### 6. What is the significance of wind speed and direction in ecology?

A) It has no ecological importance

B) It affects seed dispersal and pollination

C) It only influences temperature

D) It determines soil pH

\*\*Correct Answer: B) It affects seed dispersal and pollination\*\*

\*\*Explanation:\*\* Wind plays a crucial role in the dispersal of seeds and pollen, affecting plant distribution.

### 7. How does altitude affect the distribution of organisms?

A) It has no effect on organisms

B) It influences climate and temperature

C) It only affects animal migration

D) It only influences soil composition

\*\*Correct Answer: B) It influences climate and temperature\*\*

\*\*Explanation:\*\* Altitude affects temperature and climate conditions, which in turn influence the types of organisms that can thrive.

### 8. What is salinity, and how does it affect organisms?

A) The acidity of soil; affects plant growth

B) The concentration of salt in water; affects aquatic organisms

C) The temperature of water; affects fish distribution

D) The turbidity of water; affects light penetration

\*\*Correct Answer: B) The concentration of salt in water; affects aquatic organisms\*\*

\*\*Explanation:\*\* Salinity affects the types of organisms that can survive in aquatic environments, influencing their distribution.

### 9. How does turbidity influence aquatic ecosystems?

A) It has no effect on organisms

B) It affects light penetration and photosynthesis

C) It only influences fish populations

D) It determines water temperature

\*\*Correct Answer: B) It affects light penetration and photosynthesis\*\*

\*\*Explanation:\*\* High turbidity can reduce light penetration in water, affecting photosynthesis and the distribution of aquatic plants.

### 10. What is the role of pH in soil ecology?

A) It has no impact on plant growth

B) It influences nutrient availability

C) It only affects animal behavior

D) It determines soil texture

\*\*Correct Answer: B) It influences nutrient availability\*\*

\*\*Explanation:\*\* Soil pH affects the availability of nutrients to plants, influencing their growth and distribution.

### 11. How can secchi discs be used in ecology?

A) To measure air temperature

B) To measure water transparency

C) To measure humidity

D) To measure soil pH

\*\*Correct Answer: B) To measure water transparency\*\*

\*\*Explanation:\*\* Secchi discs are used to measure water clarity or transparency, which can indicate turbidity levels.

### 12. What equipment is used to measure air temperature?

A) Raingauge

B) Thermometer

C) Anemometer

D) Secchi disc

\*\*Correct Answer: B) Thermometer\*\*

\*\*Explanation:\*\* A thermometer is used to measure the temperature of air.

### 13. What is the purpose of a raingauge in ecology?

A) To measure soil pH

B) To measure rainfall

C) To measure wind speed

D) To measure water temperature

\*\*Correct Answer: B) To measure rainfall\*\*

\*\*Explanation:\*\* A raingauge is used to collect and measure the amount of rainfall in a specific area.

### 14. How do human activities affect the distribution of organisms?

A) They have no effect

B) They can lead to habitat destruction and pollution

C) They only affect plant species

D) They promote biodiversity

\*\*Correct Answer: B) They can lead to habitat destruction and pollution\*\*

\*\*Explanation:\*\* Human activities such as urbanization, deforestation, and pollution significantly impact the habitats and distributions of organisms.

### 15. What is an example of how animals can affect plant distribution?

A) By competing for sunlight

B) By pollinating flowers

C) By changing soil composition

D) All of the above

\*\*Correct Answer: D) All of the above\*\*

\*\*Explanation:\*\* Animals can affect plant distribution through competition, pollination, and alterations to soil structure.

### 16. How does overgrazing by livestock influence ecosystem distribution?

A) It has no significant impact

B) It can lead to soil erosion and loss of plant species

C) It promotes biodiversity

D) It helps in seed dispersal

\*\*Correct Answer: B) It can lead to soil erosion and loss of plant species\*\*

\*\*Explanation:\*\* Overgrazing can damage vegetation, leading to soil erosion and reduced plant diversity.

### 17. What is the effect of habitat fragmentation on species distribution?

A) It increases genetic diversity

B) It creates isolated populations

C) It has no effect on organisms

D) It promotes migration

\*\*Correct Answer: B) It creates isolated populations\*\*

\*\*Explanation:\*\* Habitat fragmentation leads to isolated populations, which can reduce genetic diversity and increase extinction risk.

### 18. How do invasive species affect local ecosystems?

A) They have no impact

B) They can outcompete native species for resources

C) They promote biodiversity

D) They only affect animal populations

\*\*Correct Answer: B) They can outcompete native species for resources\*\*

\*\*Explanation:\*\* Invasive species often outcompete native species, disrupting local ecosystems and altering species distributions.

### 19. What biotic factor can lead to increased competition among organisms?

A) Abundant resources

B) Limited resources

C) Favorable climate

D) High biodiversity

\*\*Correct Answer: B) Limited resources\*\*

\*\*Explanation:\*\* Limited resources such as food, water, and space can increase competition among organisms for survival.

### 20. How do seasonal changes affect organism distribution?

A) They have no effect

B) They can alter resource availability and breeding patterns

C) They only affect migratory species

D) They promote uniform distribution

\*\*Correct Answer: B) They can alter resource availability and breeding patterns\*\*

\*\*Explanation:\*\* Seasonal changes affect resource availability, which can influence breeding and distribution patterns of organisms.

### 21. What is the primary abiotic factor that influences plant growth?

A) Soil type

B) Temperature

C) Water availability

D) Light intensity

\*\*Correct Answer: C) Water availability\*\*

\*\*Explanation:\*\* Water availability is crucial for plant growth and directly affects their distribution.

### 22. How can soil erosion affect organism distribution?

A) It has no significant effect

B) It can lead to loss of habitat and resources

C) It promotes plant growth

D) It increases nutrient availability

\*\*Correct Answer: B) It can lead to loss of habitat and resources\*\*

\*\*Explanation:\*\* Soil erosion can degrade habitats, reducing resources available to both plants and animals.

### 23. What role does light intensity play in the distribution of organisms?

A) It has no effect on growth

B) It influences photosynthesis and plant growth

C) It only affects animal behavior

D) It determines soil fertility

\*\*Correct Answer: B) It influences photosynthesis and plant growth\*\*

\*\*Explanation:\*\* Light intensity affects the rate of photosynthesis, which in turn influences plant distribution and the organisms that rely on them.

### 24. How do temperature extremes affect species distribution?

A) They promote biodiversity

B) They can limit the range of species that can survive

C) They have no significant impact

D) They encourage migration

\*\*Correct Answer: B) They can limit the range of species that can survive\*\*

\*\*Explanation:\*\* Extreme temperatures can create conditions outside the tolerance limits for many species, limiting their distribution.

### 25. What is the impact of urbanization on local wildlife?

A) It enhances habitat availability

B) It leads to habitat loss and fragmentation

C) It promotes migration

D) It has no effect

\*\*Correct Answer: B) It leads to habitat loss and fragmentation\*\*

\*\*Explanation:\*\* Urbanization often results in habitat loss and fragmentation, negatively impacting local wildlife populations.

### 26. What can be measured with a thermometer in ecological studies?

A) Soil moisture

B) Air temperature

C) Water turbidity

D) Light intensity

\*\*Correct Answer: B) Air temperature\*\*

\*\*Explanation:\*\* A thermometer is used to measure air temperature, which is an important abiotic factor in ecology.

### 27. What is the effect of increased carbon dioxide levels on plant growth?

A) It has no effect

B) It can enhance photosynthesis

C) It inhibits growth

D) It reduces nutrient availability

\*\*Correct Answer: B) It can enhance photosynthesis\*\*

\*\*Explanation:\*\* Increased carbon dioxide levels can enhance the rate of photosynthesis, promoting plant growth.

### 28. How does human pollution affect aquatic ecosystems?

A) It improves water quality

B) It depletes oxygen and harms aquatic life

C) It has no effect

D) It promotes biodiversity

\*\*Correct Answer: B) It depletes oxygen and harms aquatic life\*\*

\*\*Explanation:\*\* Pollution can introduce toxins and reduce oxygen levels in water, negatively impacting aquatic organisms.

### 29. What is the relationship between altitude and temperature?

A) Temperature increases with altitude

B) Temperature decreases with altitude

C) There is no relationship

D) Temperature fluctuates randomly with altitude

\*\*Correct Answer: B) Temperature decreases with altitude\*\*

\*\*Explanation:\*\* Generally, temperature decreases as altitude increases due to thinner air and reduced atmospheric pressure.

### 30. How does soil texture influence plant distribution?

A) It has no effect on growth

B) It affects water retention and nutrient availability

C) It only influences animal habitats

D) It determines light penetration

\*\*Correct Answer: B) It affects water retention and nutrient availability\*\*

\*\*Explanation:\*\* Soil texture influences how well soil retains water and nutrients, affecting plant growth and distribution.

### 31. What equipment would you use to measure soil pH?

A) Thermometer

B) pH meter

C) Raingauge

D) Anemometer

\*\*Correct Answer: B) pH meter\*\*

\*\*Explanation:\*\* A pH meter is used to measure the acidity or alkalinity of soil, an important abiotic factor for plant growth.

### 32. How do seasonal migrations affect animal distribution?

A) They have no impact

B) They can change population dynamics

C) They lead to habitat destruction

D) They promote uniform distribution

\*\*Correct Answer: B) They can change population dynamics\*\*

\*\*Explanation:\*\* Seasonal migrations can alter population sizes and distributions as animals move to find resources.

### 33. How can human activities such as deforestation affect the distribution of species?

A) They promote biodiversity

B) They create new habitats

C) They lead to habitat loss and species decline

D) They have no significant impact

\*\*Correct Answer: C) They lead to habitat loss and species decline\*\*

\*\*Explanation:\*\* Deforestation results in habitat loss, which can lead to declines in species populations and biodiversity.

### 34. What effect does water turbidity have on aquatic plants?

A) It promotes growth

B) It inhibits photosynthesis

C) It has no effect

D) It increases nutrient levels

\*\*Correct Answer: B) It inhibits photosynthesis\*\*

\*\*Explanation:\*\* High turbidity reduces light penetration, inhibiting photosynthesis in aquatic plants.

### 35. How does salinity affect freshwater organisms?

A) It promotes growth

B) It can be toxic to many species

C) It has no effect

D) It enhances reproduction

\*\*Correct Answer: B) It can be toxic to many species\*\*

\*\*Explanation:\*\* Increased salinity can be harmful or lethal to freshwater organisms adapted to low salt concentrations.

### 36. What is the primary abiotic factor that influences terrestrial ecosystems?

A) Temperature

B) Soil type

C) Water availability

D) Light intensity

\*\*Correct Answer: C) Water availability\*\*

\*\*Explanation:\*\* Water availability is a critical abiotic factor that influences the types of organisms that can thrive in terrestrial ecosystems.

### 37. How does competition affect the distribution of species?

A) It has no effect

B) It can limit the population of less competitive species

C) It promotes cooperation

D) It leads to increased biodiversity

\*\*Correct Answer: B) It can limit the population of less competitive species\*\*

\*\*Explanation:\*\* Competition for resources can limit the population sizes and distribution of less competitive species.

### 38. What can be inferred about organisms in extreme environments?

A) They are less adaptable

B) They often have specialized adaptations

C) They are all large species

D) They have no predators

\*\*Correct Answer: B) They often have specialized adaptations\*\*

\*\*Explanation:\*\* Organisms in extreme environments typically evolve specialized adaptations that enable their survival.

### 39. What is the primary role of decomposers in an ecosystem?

A) To produce energy

B) To recycle nutrients

C) To compete with plants

D) To consume primary producers

\*\*Correct Answer: B) To recycle nutrients\*\*

\*\*Explanation:\*\* Decomposers break down dead organic matter, recycling nutrients back into the ecosystem.

### 40. How do changes in wind patterns affect plant distribution?

A) They have no effect

B) They can alter seed dispersal mechanisms

C) They only affect animal populations

D) They promote uniform growth

\*\*Correct Answer: B) They can alter seed dispersal mechanisms\*\*

\*\*Explanation:\*\* Changes in wind patterns can influence how seeds are dispersed, affecting plant distribution.

### 41. What is the effect of human-induced climate change on species distribution?

A) It promotes biodiversity

B) It leads to range shifts and extinction

C) It has no significant effect

D) It stabilizes ecosystems

\*\*Correct Answer: B) It leads to range shifts and extinction\*\*

\*\*Explanation:\*\* Climate change can cause species to shift their ranges or face extinction due to changing habitats.

### 42. What equipment would you use to measure wind speed?

A) Thermometer

B) Anemometer

C) Raingauge

D) Secchi disc

\*\*Correct Answer: B) Anemometer\*\*

\*\*Explanation:\*\* An anemometer is used to measure wind speed, an important abiotic factor in ecology.

### 43. How does the presence of pollutants affect aquatic ecosystems?

A) It improves biodiversity

B) It has no effect

C) It can harm aquatic life and disrupt food webs

D) It promotes plant growth

\*\*Correct Answer: C) It can harm aquatic life and disrupt food webs\*\*

\*\*Explanation:\*\* Pollutants can be toxic to aquatic organisms and disrupt the balance of aquatic ecosystems.

### 44. What role does soil fertility play in the distribution of organisms?

A) It has no impact

B) It determines plant growth and species composition

C) It only affects animal populations

D) It promotes uniform plant distribution

\*\*Correct Answer: B) It determines plant growth and species composition\*\*

\*\*Explanation:\*\* Soil fertility influences plant growth, which in turn affects the distribution of organisms dependent on those plants.

### 45. How do seasonal changes in temperature affect animal behavior?

A) They lead to uniform behavior

B) They can trigger migration and breeding patterns

C) They have no effect

D) They only affect plant growth

\*\*Correct Answer: B) They can trigger migration and breeding patterns\*\*

\*\*Explanation:\*\* Seasonal temperature changes can influence migration and reproductive behaviors in many animal species.

### 46. What is the primary consequence of habitat destruction?

A) Increased biodiversity

B) Loss of species and resources

C) Improved ecosystem health

D) Enhanced species interactions

\*\*Correct Answer: B) Loss of species and resources\*\*

\*\*Explanation:\*\* Habitat destruction leads to the loss of species and essential resources, negatively impacting biodiversity.

### 47. How does light pollution affect nocturnal organisms?

A) It enhances their hunting abilities

B) It disrupts their natural behaviors

C) It has no effect

D) It promotes habitat growth

\*\*Correct Answer: B) It disrupts their natural behaviors\*\*

\*\*Explanation:\*\* Light pollution can interfere with the natural behaviors of nocturnal organisms, such as hunting and mating.

### 48. What is the primary factor influencing the distribution of coral reefs?

A) Soil type

B) Water temperature and quality

C) Wind speed

D) Altitude

\*\*Correct Answer: B) Water temperature and quality\*\*

\*\*Explanation:\*\* Coral reefs are primarily influenced by water temperature and quality, which affect their health and distribution.

### 49. How does the introduction of fertilizers impact soil ecosystems?

A) It has no effect on organisms

B) It can lead to nutrient runoff and eutrophication

C) It promotes biodiversity

D) It stabilizes soil composition

\*\*Correct Answer: B) It can lead to nutrient runoff and eutrophication\*\*

\*\*Explanation:\*\* Excessive fertilizer use can result in nutrient runoff, leading to eutrophication and harming aquatic ecosystems.

### 50. What is the role of ecological succession in species distribution?

A) It has no impact

B) It promotes uniformity in ecosystems

C) It leads to changes in species composition over time

D) It only affects plant species

\*\*Correct Answer: C) It leads to changes in species composition over time\*\*

\*\*Explanation:\*\* Ecological succession results in gradual changes in species composition, influencing distribution patterns.

### 51. How can overfishing impact marine ecosystems?

A) It promotes fish population growth

B) It leads to the decline of fish stocks and disrupts food webs

C) It has no effect on ecosystems

D) It improves biodiversity

\*\*Correct Answer: B) It leads to the decline of fish stocks and disrupts food webs\*\*

\*\*Explanation:\*\* Overfishing can deplete fish populations, disrupting marine food webs and ecosystem balance.

1. **Symbiotic interactions of plants and animals**

### 1. What is symbiosis?

A) Competition between species

B) A relationship between two different species

C) A type of food chain

D) A method of nutrient cycling

\*\*Correct Answer: B) A relationship between two different species\*\*

\*\*Explanation:\*\* Symbiosis refers to a close and long-term interaction between two different species.

### 2. Which of the following is an example of mutualism?

A) A tick feeding on a dog

B) Bees pollinating flowers

C) A barnacle on a whale

D) Fungi decomposing organic matter

\*\*Correct Answer: B) Bees pollinating flowers\*\*

\*\*Explanation:\*\* Mutualism is a symbiotic relationship where both species benefit, such as bees pollinating flowers while collecting nectar.

### 3. What type of interaction occurs when one organism benefits at the expense of another?

A) Commensalism

B) Mutualism

C) Parasitism

D) Competition

\*\*Correct Answer: C) Parasitism\*\*

\*\*Explanation:\*\* Parasitism is a relationship where one organism benefits while harming the other, such as a parasite living in a host.

### 4. Which of the following describes commensalism?

A) Both species benefit

B) One species benefits, and the other is harmed

C) One species benefits, and the other is unaffected

D) Both species are harmed

\*\*Correct Answer: C) One species benefits, and the other is unaffected\*\*

\*\*Explanation:\*\* In commensalism, one species benefits while the other is neither helped nor harmed.

### 5. What is the primary source of energy in an ecosystem?

A) Soil nutrients

B) Sunlight

C) Wind

D) Water

\*\*Correct Answer: B) Sunlight\*\*

\*\*Explanation:\*\* Sunlight is the primary source of energy for most ecosystems, driving photosynthesis in plants.

### 6. What is a food chain?

A) A complex network of feeding relationships

B) A linear sequence of organisms where each is eaten by the next

C) A type of nutrient cycle

D) A measure of energy flow

\*\*Correct Answer: B) A linear sequence of organisms where each is eaten by the next\*\*

\*\*Explanation:\*\* A food chain shows a linear progression of energy flow through the trophic levels of an ecosystem.

### 7. How do food webs differ from food chains?

A) Food webs are more complex

B) Food webs have fewer organisms

C) Food webs only include plants

D) Food webs do not show energy flow

\*\*Correct Answer: A) Food webs are more complex\*\*

\*\*Explanation:\*\* Food webs consist of interconnected food chains, showing the complexity of feeding relationships in an ecosystem.

### 8. What are trophic levels?

A) The layers of soil in an ecosystem

B) The levels of organization in a food web

C) The positions of organisms in a food chain based on their feeding relationships

D) The levels of pollution in an environment

\*\*Correct Answer: C) The positions of organisms in a food chain based on their feeding relationships\*\*

\*\*Explanation:\*\* Trophic levels categorize organisms based on their source of energy, such as producers, primary consumers, and secondary consumers.

### 9. Which organisms are primarily involved in the carbon cycle?

A) Herbivores

B) Decomposers

C) Producers and consumers

D) All of the above

\*\*Correct Answer: D) All of the above\*\*

\*\*Explanation:\*\* All organisms, including producers, consumers, and decomposers, play roles in the carbon cycle.

### 10. What is the significance of the carbon cycle?

A) It affects only plant growth

B) It regulates the availability of oxygen and carbon dioxide

C) It has no impact on climate

D) It only involves animals

\*\*Correct Answer: B) It regulates the availability of oxygen and carbon dioxide\*\*

\*\*Explanation:\*\* The carbon cycle is essential for maintaining the balance of atmospheric gases crucial for life and climate regulation.

### 11. How do plants contribute to the carbon cycle?

A) By emitting carbon dioxide

B) By absorbing carbon dioxide during photosynthesis

C) By decomposing organic matter

D) By using oxygen for respiration

\*\*Correct Answer: B) By absorbing carbon dioxide during photosynthesis\*\*

\*\*Explanation:\*\* Plants absorb carbon dioxide from the atmosphere during photosynthesis, contributing to the carbon cycle.

### 12. What role do decomposers play in nutrient cycling?

A) They consume primary producers

B) They break down dead organic matter and recycle nutrients

C) They compete with plants for resources

D) They produce energy

\*\*Correct Answer: B) They break down dead organic matter and recycle nutrients\*\*

\*\*Explanation:\*\* Decomposers decompose organic material, returning nutrients to the soil and making them available for plants.

### 13. What is the water cycle?

A) The movement of water through the atmosphere, soil, and organisms

B) The cycling of nutrients in soil

C) The transformation of energy in an ecosystem

D) The flow of food through trophic levels

\*\*Correct Answer: A) The movement of water through the atmosphere, soil, and organisms\*\*

\*\*Explanation:\*\* The water cycle describes how water evaporates, condenses, and precipitates back to Earth, circulating through different environments.

### 14. How does water availability affect plant distribution?

A) It has no impact

B) It determines soil type

C) It influences growth and survival rates

D) It only affects animal populations

\*\*Correct Answer: C) It influences growth and survival rates\*\*

\*\*Explanation:\*\* Water availability is crucial for plant growth, affecting their distribution and the animals that depend on them.

### 15. What is the nitrogen cycle?

A) The cycling of carbon in ecosystems

B) The conversion of nitrogen compounds in the environment

C) The movement of water between different states

D) The flow of energy through food webs

\*\*Correct Answer: B) The conversion of nitrogen compounds in the environment\*\*

\*\*Explanation:\*\* The nitrogen cycle involves the transformation of nitrogen through various forms, including fixation, nitrification, and denitrification.

### 16. How do legumes contribute to the nitrogen cycle?

A) They absorb nitrogen from the atmosphere

B) They have root nodules that house nitrogen-fixing bacteria

C) They decompose organic matter

D) They compete with other plants for nitrogen

\*\*Correct Answer: B) They have root nodules that house nitrogen-fixing bacteria\*\*

\*\*Explanation:\*\* Leguminous plants form symbiotic relationships with nitrogen-fixing bacteria in their root nodules, converting atmospheric nitrogen into usable forms.

### 17. What is the effect of deforestation on the carbon cycle?

A) It increases carbon storage

B) It has no effect

C) It reduces carbon dioxide levels

D) It increases carbon dioxide levels in the atmosphere

\*\*Correct Answer: D) It increases carbon dioxide levels in the atmosphere\*\*

\*\*Explanation:\*\* Deforestation decreases the number of trees available to absorb carbon dioxide, leading to higher atmospheric CO2 levels.

### 18. How do trophic levels relate to energy flow in an ecosystem?

A) Energy increases at higher trophic levels

B) Energy decreases as it moves up trophic levels

C) Energy flow is constant across levels

D) Energy is only found at the producer level

\*\*Correct Answer: B) Energy decreases as it moves up trophic levels\*\*

\*\*Explanation:\*\* Energy diminishes at higher trophic levels due to energy loss through metabolism and heat.

### 19. What is a primary producer?

A) An organism that consumes other organisms

B) An organism that converts sunlight into energy

C) An organism that decomposes organic matter

D) An organism that competes for resources

\*\*Correct Answer: B) An organism that converts sunlight into energy\*\*

\*\*Explanation:\*\* Primary producers, such as plants, convert sunlight into energy through photosynthesis, forming the base of food chains.

### 20. How do bacteria contribute to the nitrogen cycle?

A) They decompose organic matter

B) They fix nitrogen from the atmosphere

C) They absorb nutrients through their cell walls

D) They compete with plants for nitrogen

\*\*Correct Answer: B) They fix nitrogen from the atmosphere\*\*

\*\*Explanation:\*\* Certain bacteria convert atmospheric nitrogen into forms that plants can use, playing a critical role in the nitrogen cycle.

### 21. What is the role of a consumer in an ecosystem?

A) To produce energy

B) To decompose dead matter

C) To consume other organisms for energy

D) To compete for resources

\*\*Correct Answer: C) To consume other organisms for energy\*\*

\*\*Explanation:\*\* Consumers obtain energy by feeding on other organisms, including plants and animals.

### 22. In a food web, what does an arrow represent?

A) The energy loss

B) The direction of energy flow

C) The competition between species

D) The number of organisms

\*\*Correct Answer: B) The direction of energy flow\*\*

\*\*Explanation:\*\* In a food web, arrows indicate the direction in which energy is transferred from one organism to another.

### 23. What type of interaction involves one species benefiting while the other is harmed?

A) Mutualism

B) Commensalism

C) Parasitism

D) Competition

\*\*Correct Answer: C) Parasitism\*\*

\*\*Explanation:\*\* Parasitism involves one organism benefiting at the expense of another, causing harm to the host.

### 24. What is an example of competition in an ecosystem?

A) Bees pollinating flowers

B) Two plants competing for sunlight

C) Fungi decomposing organic matter

D) A bird nesting in a tree

\*\*Correct Answer: B) Two plants competing for sunlight\*\*

\*\*Explanation:\*\* Competition occurs when two or more organisms vie for the same resource, such as sunlight.

### 25. How does the carbon cycle affect global warming?

A) It has no effect

B) Increased carbon dioxide levels contribute to global warming

C) It only affects plant growth

D) It promotes cooling

\*\*Correct Answer: B) Increased carbon dioxide levels contribute to global warming\*\*

\*\*Explanation:\*\* High levels of carbon dioxide from human activities lead to enhanced greenhouse effects, contributing to global warming.

### 26. What is the primary source of nitrogen for plants?

A) Soil nutrients

B) Atmospheric nitrogen fixed by bacteria

C) Decomposed organic matter

D) Water absorption

\*\*Correct Answer: B) Atmospheric nitrogen fixed by bacteria\*\*

\*\*Explanation:\*\* Nitrogen-fixing bacteria convert atmospheric nitrogen into forms that plants can absorb and use.

### 27. How does nutrient cycling benefit ecosystems?

A) It has no impact on ecosystems

B) It ensures the continuous availability of essential nutrients

C) It reduces biodiversity

D) It promotes soil erosion

\*\*Correct Answer: B) It ensures the continuous availability of essential nutrients\*\*

\*\*Explanation:\*\* Nutrient cycling replenishes essential nutrients in ecosystems, supporting plant growth and overall ecosystem health.

### 28. What is the significance of the water cycle to other nutrient cycles?

A) It has no significance

B) It regulates temperature

C) It is essential for transporting nutrients

D) It only affects aquatic ecosystems

\*\*Correct Answer: C) It is essential for transporting nutrients\*\*

\*\*Explanation:\*\* The water cycle facilitates the movement of nutrients through ecosystems via rainfall, runoff, and groundwater.

### 29. What type of symbiotic relationship exists between mycorrhizal fungi and plants?

A) Parasitism

B) Commensalism

C) Mutualism

D) Competition

\*\*Correct Answer: C) Mutualism\*\*

\*\*Explanation:\*\* Mycorrhizal fungi form mutualistic relationships with plants, enhancing nutrient uptake in exchange for carbohydrates.

### 30. How do herbivores affect primary producers in an ecosystem?

A) They promote their growth

B) They compete with them

C) They consume them, impacting their distribution

D) They have no effect

\*\*Correct Answer: C) They consume them, impacting their distribution\*\*

\*\*Explanation:\*\* Herbivores directly impact primary producers by consuming them, which can affect their population and distribution.

### 31. What is the primary function of the nitrogen-fixing bacteria in legumes?

A) To decompose organic matter

B) To enhance photosynthesis

C) To convert atmospheric nitrogen into ammonia

D) To compete for soil nutrients

\*\*Correct Answer: C) To convert atmospheric nitrogen into ammonia\*\*

\*\*Explanation:\*\* Nitrogen-fixing bacteria in legume root nodules convert atmospheric nitrogen into ammonia, making it available for plant use.

### 32. What is the impact of global warming on the carbon cycle?

A) It reduces carbon dioxide levels

B) It increases carbon dioxide emissions

C) It has no effect

D) It promotes photosynthesis

\*\*Correct Answer: B) It increases carbon dioxide emissions\*\*

\*\*Explanation:\*\* Global warming is exacerbated by increased carbon dioxide emissions from human activities, disrupting the carbon cycle.

### 33. How does nutrient cycling contribute to soil fertility?

A) It reduces nutrient availability

B) It promotes the accumulation of organic matter

C) It has no impact on soil quality

D) It only benefits plant growth

\*\*Correct Answer: B) It promotes the accumulation of organic matter\*\*

\*\*Explanation:\*\* Nutrient cycling enhances soil fertility by recycling nutrients and organic matter, supporting healthy plant growth.

### 34. Which process is NOT part of the water cycle?

A) Evaporation

B) Transpiration

C) Nitrification

D) Precipitation

\*\*Correct Answer: C) Nitrification\*\*

\*\*Explanation:\*\* Nitrification is part of the nitrogen cycle, not the water cycle, which includes evaporation, transpiration, and precipitation.

### 35. What effect does deforestation have on the carbon cycle?

A) It increases carbon sequestration

B) It leads to increased carbon emissions

C) It has no impact on carbon levels

D) It promotes biodiversity

\*\*Correct Answer: B) It leads to increased carbon emissions\*\*

\*\*Explanation:\*\* Deforestation reduces the number of trees that can absorb carbon dioxide, leading to higher carbon emissions.

### 36. What role do primary producers play in food chains?

A) They are the top consumers

B) They convert energy from sunlight into chemical energy

C) They decompose organic material

D) They compete for resources

\*\*Correct Answer: B) They convert energy from sunlight into chemical energy\*\*

\*\*Explanation:\*\* Primary producers, such as plants, convert sunlight into chemical energy through photosynthesis, forming the base of food chains.

### 37. In a food web, what does a primary consumer do?

A) It produces energy

B) It consumes producers

C) It decomposes dead matter

D) It competes with other herbivores

\*\*Correct Answer: B) It consumes producers\*\*

\*\*Explanation:\*\* Primary consumers are herbivores that feed on primary producers, obtaining energy from them.

### 38. How does the carbon cycle relate to photosynthesis?

A) Photosynthesis increases carbon dioxide levels

B) Photosynthesis removes carbon dioxide from the atmosphere

C) Photosynthesis has no connection to the carbon cycle

D) Photosynthesis decreases oxygen levels

\*\*Correct Answer: B) Photosynthesis removes carbon dioxide from the atmosphere\*\*

\*\*Explanation:\*\* Photosynthesis utilizes carbon dioxide from the atmosphere, playing a key role in the carbon cycle.

### 39. What is the primary role of decomposers in nutrient cycling?

A) To produce energy

B) To consume producers

C) To recycle nutrients from dead organic matter

D) To compete with primary consumers

\*\*Correct Answer: C) To recycle nutrients from dead organic matter\*\*

\*\*Explanation:\*\* Decomposers break down dead organisms, returning nutrients to the soil and supporting nutrient cycling.

### 40. How do bacteria contribute to the nitrogen cycle during decomposition?

A) They have no role

B) They release nitrogen gas into the atmosphere

C) They convert organic nitrogen into ammonia

D) They compete with plants for nitrogen

\*\*Correct Answer: C) They convert organic nitrogen into ammonia\*\*

\*\*Explanation:\*\* Bacteria decompose organic matter, converting organic nitrogen into ammonia, which can be used by plants.

### 41. What is the significance of the water cycle to the carbon cycle?

A) It has no significance

B) It helps transport carbon compounds

C) It reduces carbon levels in the atmosphere

D) It promotes photosynthesis

\*\*Correct Answer: B) It helps transport carbon compounds\*\*

\*\*Explanation:\*\* The water cycle assists in the transport of carbon compounds through precipitation and runoff, linking the two cycles.

### 42. What is the primary driver of energy flow in an ecosystem?

A) Decomposers

B) Sunlight

C) Water

D) Soil nutrients

\*\*Correct Answer: B) Sunlight\*\*

\*\*Explanation:\*\* Sunlight is the primary energy source for ecosystems, driving photosynthesis in primary producers.

### 43. How do legumes improve soil fertility?

A) By depleting nutrients

B) By fixing nitrogen from the atmosphere

C) By competing with other plants

D) By increasing soil acidity

\*\*Correct Answer: B) By fixing nitrogen from the atmosphere\*\*

\*\*Explanation:\*\* Leguminous plants host nitrogen-fixing bacteria, enhancing soil fertility by adding nitrogen.

### 44. What is the primary source of energy in food chains?

A) Decomposers

B) Producers

C) Consumers

D) Nutrients

\*\*Correct Answer: B) Producers\*\*

\*\*Explanation:\*\* Producers are the primary source of energy in food chains, converting sunlight into chemical energy through photosynthesis.

### 45. Which of the following is a consequence of nutrient cycling?

A) Decreased biodiversity

B) Improved soil quality

C) Reduced energy flow

D) Increased pollution

\*\*Correct Answer: B) Improved soil quality\*\*

\*\*Explanation:\*\* Nutrient cycling replenishes essential nutrients in the soil, improving soil quality and supporting plant growth.

### 46. How does water availability influence the nitrogen cycle?

A) It has no effect

B) It enhances nitrogen fixation

C) It reduces nitrogen levels

D) It promotes soil erosion

\*\*Correct Answer: B) It enhances nitrogen fixation\*\*

\*\*Explanation:\*\* Adequate water availability supports the growth of nitrogen-fixing bacteria, enhancing nitrogen fixation in the soil.

### 47. What is the impact of excess nitrogen in ecosystems?

A) It promotes plant growth

B) It leads to eutrophication in aquatic systems

C) It has no impact

D) It decreases biodiversity

\*\*Correct Answer: B) It leads to eutrophication in aquatic systems\*\*

\*\*Explanation:\*\* Excess nitrogen can cause nutrient pollution, leading to algal blooms and oxygen depletion in aquatic ecosystems.

### 48. What role does sunlight play in the carbon cycle?

A) It increases carbon dioxide levels

B) It drives photosynthesis, removing carbon dioxide from the atmosphere

C) It has no impact on the carbon cycle

D) It only affects temperature

\*\*Correct Answer: B) It drives photosynthesis, removing carbon dioxide from the atmosphere\*\*

\*\*Explanation:\*\* Sunlight is essential for photosynthesis, which removes carbon dioxide from the atmosphere and converts it into biomass.

### 49. How do abiotic factors influence food webs?

A) They have no influence

B) They determine the types of organisms present

C) They only affect plant competition

D) They promote cooperation among species

\*\*Correct Answer: B) They determine the types of organism present

1. **Natural Habitats**

1. Which of the following is an example of an aquatic habitat?

A) Desert

B) Pond

C) Forest

D) Grassland

\*\*Correct Answer: B) Pond\*\*

\*\*Explanation:\*\* A pond is an aquatic habitat, characterized by its water environment.

### 2. What type of habitat is characterized by saltwater?

A) Freshwater

B) Terrestrial

C) Marine

D) Arboreal

\*\*Correct Answer: C) Marine\*\*

\*\*Explanation:\*\* Marine habitats are characterized by saltwater, including oceans and seas.

### 3. Which of the following organisms is commonly found in mangrove swamps?

A) Cacti

B) Coral

C) Mangrove trees

D) Desert foxes

\*\*Correct Answer: C) Mangrove trees\*\*

\*\*Explanation:\*\* Mangrove swamps are home to mangrove trees, which have adapted to saline conditions.

### 4. What is a key characteristic of streams as an aquatic habitat?

A) Still water

B) Flowing water

C) High salinity

D) Low biodiversity

\*\*Correct Answer: B) Flowing water\*\*

\*\*Explanation:\*\* Streams are defined by their flowing water, which affects the organisms living there.

### 5. Which animal is typically found in lakes?

A) Sea turtles

B) Freshwater fish

C) Coral reefs

D) Desert snakes

\*\*Correct Answer: B) Freshwater fish\*\*

\*\*Explanation:\*\* Freshwater fish inhabit lakes, which are bodies of standing freshwater.

### 6. What type of habitat do arboreal organisms primarily inhabit?

A) Ground level

B) Underwater

C) Tree tops

D) Desert

\*\*Correct Answer: C) Tree tops\*\*

\*\*Explanation:\*\* Arboreal organisms live in trees, often in the canopy where they can access food and shelter.

### 7. Which animal is well-adapted to living in a savanna habitat?

A) Polar bear

B) Elephant

C) Penguin

D) Dolphin

\*\*Correct Answer: B) Elephant\*\*

\*\*Explanation:\*\* Elephants are adapted to savanna habitats, where they can forage for vegetation.

### 8. What adaptive feature might you find in a plant living in a dry grassy field?

A) Large leaves

B) Deep roots

C) Floating stems

D) Thick bark

\*\*Correct Answer: B) Deep roots\*\*

\*\*Explanation:\*\* Deep roots help plants access water in dry environments, such as savannas.

### 9. How do aquatic plants like lilies adapt to their habitat?

A) They have deep roots

B) They have buoyant leaves

C) They have thick bark

D) They grow underground

\*\*Correct Answer: B) They have buoyant leaves\*\*

\*\*Explanation:\*\* Buoyant leaves allow aquatic plants to float on the water surface, maximizing sunlight exposure.

### 10. Which of the following adaptations helps animals in mangrove swamps?

A) Strong legs for running

B) Ability to tolerate salt

C) Bright colors for camouflage

D) Long necks for reaching high branches

\*\*Correct Answer: B) Ability to tolerate salt\*\*

\*\*Explanation:\*\* Animals in mangrove swamps must adapt to the high salinity of their environment.

### 11. What type of habitat is characterized by seasonal flooding?

A) Desert

B) Grassland

C) Wetland

D) Tundra

\*\*Correct Answer: C) Wetland\*\*

\*\*Explanation:\*\* Wetlands are habitats that experience periodic flooding, providing unique conditions for plant and animal life.

### 12. Which plant adaptation is common in aquatic environments?

A) Thick cuticles

B) Floating leaves

C) Deep roots

D) Small seeds

\*\*Correct Answer: B) Floating leaves\*\*

\*\*Explanation:\*\* Floating leaves help aquatic plants maximize sunlight while remaining buoyant in water.

### 13. What type of animals would you expect to find in a pond habitat?

A) Marine mammals

B) Freshwater turtles and frogs

C) Desert reptiles

D) Arctic birds

\*\*Correct Answer: B) Freshwater turtles and frogs\*\*

\*\*Explanation:\*\* Freshwater turtles and frogs are well-suited to pond habitats.

### 14. How do terrestrial plants adapt to drought conditions?

A) By growing fast

B) By developing shallow roots

C) By storing water in their tissues

D) By having large leaves

\*\*Correct Answer: C) By storing water in their tissues\*\*

\*\*Explanation:\*\* Many terrestrial plants in dry habitats store water in their tissues to survive drought conditions.

### 15. Which characteristic defines a seashore habitat?

A) High salinity and tidal fluctuations

B) Low humidity and high temperatures

C) Constantly flowing water

D) Dense forest cover

\*\*Correct Answer: A) High salinity and tidal fluctuations\*\*

\*\*Explanation:\*\* Seashore habitats are influenced by tides and have high salinity due to proximity to the ocean.

### 16. What type of organism is likely to thrive in a dry grassy field?

A) Aquatic plants

B) Cacti

C) Ferns

D) Mangroves

\*\*Correct Answer: B) Cacti\*\*

\*\*Explanation:\*\* Cacti are well adapted to dry, arid environments and can thrive in dry grassy fields.

### 17. How do animals in arboreal habitats typically move?

A) On the ground

B) Through water

C) Through trees

D) Underground

\*\*Correct Answer: C) Through trees\*\*

\*\*Explanation:\*\* Arboreal animals are adapted to climbing and moving through trees.

### 18. What is a common adaptive feature of animals living in the savanna?

A) Thick fur

B) Camouflage coloring

C) Water storage in tissues

D) Very short legs

\*\*Correct Answer: B) Camouflage coloring\*\*

\*\*Explanation:\*\* Camouflage helps savanna animals blend in with their environment to avoid predators.

### 19. Which type of organism can be found in both terrestrial and aquatic habitats?

A) Cacti

B) Amphibians

C) Fish

D) Birds

\*\*Correct Answer: B) Amphibians\*\*

\*\*Explanation:\*\* Amphibians, such as frogs, can live in both terrestrial and aquatic environments.

### 20. What characteristic of a stream habitat affects the organisms living there?

A) High salinity

B) Temperature fluctuations

C) Flowing water and oxygen levels

D) Constant light

\*\*Correct Answer: C) Flowing water and oxygen levels\*\*

\*\*Explanation:\*\* Flowing water in streams affects oxygen availability, which is crucial for aquatic life.

### 21. Which of the following is a common feature of animals in mangrove habitats?

A) Ability to fly

B) Ability to swim

C) Ability to tolerate both saltwater and freshwater

D) Ability to burrow underground

\*\*Correct Answer: C) Ability to tolerate both saltwater and freshwater\*\*

\*\*Explanation:\*\* Many animals in mangrove habitats can tolerate variations in salinity due to the brackish water.

### 22. How do trees in a rainforest adapt to high rainfall?

A) Deep roots

B) Thick trunks

C) Drip tips on leaves

D) Small leaves

\*\*Correct Answer: C) Drip tips on leaves\*\*

\*\*Explanation:\*\* Drip tips help rainwater run off leaves quickly, preventing mold and allowing sunlight penetration.

### 23. What is a characteristic of organisms in a pond ecosystem?

A) They all require saltwater

B) They are adapted to still water

C) They all have gills

D) They are all terrestrial

\*\*Correct Answer: B) They are adapted to still water\*\*

\*\*Explanation:\*\* Organisms in pond ecosystems are adapted to live in still water with varying depths.

### 24. Which animal is typically found in a dry grassy field?

A) Polar bear

B) Bison

C) Penguin

D) Salmon

\*\*Correct Answer: B) Bison\*\*

\*\*Explanation:\*\* Bison are adapted to live in grassland habitats such as dry grassy fields.

### 25. How does the structure of aquatic plants differ from terrestrial plants?

A) Aquatic plants have deeper roots

B) Aquatic plants have buoyant stems and leaves

C) Aquatic plants have thicker bark

D) Aquatic plants are always flowering

\*\*Correct Answer: B) Aquatic plants have buoyant stems and leaves\*\*

\*\*Explanation:\*\* Aquatic plants often have adaptations like buoyant stems and leaves to float on water.

### 26. What is a common adaptation of animals living in tree canopies?

A) Strong legs for running

B) Climbing and grasping limbs

C) Ability to burrow

D) Large body size

\*\*Correct Answer: B) Climbing and grasping limbs\*\*

\*\*Explanation:\*\* Animals in tree canopies typically have adaptations that allow them to climb and navigate branches.

### 27. How does the distribution of organisms in a savanna differ from that in a rainforest?

A) Savanna has more biodiversity

B) Rainforest has more dense vegetation

C) Savanna has no large animals

D) Rainforest has only herbivores

\*\*Correct Answer: B) Rainforest has more dense vegetation\*\*

\*\*Explanation:\*\* Rainforests have dense and diverse vegetation compared to the more open and sparse vegetation of savannas.

### 28. What adaptation helps shorebirds thrive in seashore habitats?

A) Strong wings for flying

B) Long legs for wading

C) Ability to swim

D) Ability to burrow

\*\*Correct Answer: B) Long legs for wading\*\*

\*\*Explanation:\*\* Long legs help shorebirds wade through shallow water while foraging for food.

### 29. Which of the following plants is adapted to wetland habitats?

A) Cacti

B) Mangroves

C) Pine trees

D) Desert shrubs

\*\*Correct Answer: B) Mangroves\*\*

\*\*Explanation:\*\* Mangroves are specially adapted to thrive in wetland habitats, tolerating both saltwater and freshwater.

### 30. How do polar bears adapt to their cold Arctic habitat?

A) They have thick fur and a layer of fat

B) They have small ears

C) They are nocturnal

D) They have bright colors

\*\*Correct Answer: A) They have thick fur and a layer of fat\*\*

\*\*Explanation:\*\* Polar bears have thick fur and a layer of blubber to insulate against the cold.

### 31. What type of plants dominate a dry savanna?

A) Aquatic plants

B) Cacti

C) Grasses and scattered trees

D) Coniferous trees

\*\*Correct Answer: C) Grasses and scattered trees\*\*

\*\*Explanation:\*\* Dry savannas are characterized by grasses and a few scattered trees adapted to the environment.

### 32. How do organisms in a stream habitat obtain oxygen?

A) From the soil

B) From the air

C) From dissolved oxygen in water

D) From plants

\*\*Correct Answer: C) From dissolved oxygen in water\*\*

\*\*Explanation:\*\* Organisms in streams obtain oxygen from the dissolved oxygen present in the water.

### 33. What type of habitat is characterized by high biodiversity and dense vegetation?

A) Desert

B) Savanna

C) Rainforest

D) Tundra

\*\*Correct Answer: C) Rainforest\*\*

\*\*Explanation:\*\* Rainforests are known for their high biodiversity and dense, layered vegetation.

### 34. How do adaptations to aquatic life differ from those in terrestrial life?

A) Aquatic organisms have deeper roots

B) Aquatic organisms have adaptations for buoyancy and swimming

C) Aquatic organisms are always larger

D) Terrestrial organisms have gills

\*\*Correct Answer: B) Aquatic organisms have adaptations for buoyancy and swimming\*\*

\*\*Explanation:\*\* Aquatic organisms have various adaptations, such as specialized fins and buoyant structures, to navigate their environments.

### 35. What is a key feature of organisms in a coastal habitat?

A) They only survive in freshwater

B) They can tolerate saltwater and tidal changes

C) They only eat terrestrial plants

D) They are all migratory

\*\*Correct Answer: B) They can tolerate saltwater and tidal changes\*\*

\*\*Explanation:\*\* Organisms in coastal habitats must adapt to fluctuating salinity and tidal conditions.

### 36. Which of the following organisms is commonly found in abandoned farmland?

A) Urban foxes

B) Weeds and grasses

C) Coral reefs

D) Arctic foxes

\*\*Correct Answer: B) Weeds and grasses\*\*

\*\*Explanation:\*\* Abandoned farmland often becomes overgrown with weeds and grasses as the ecosystem begins to recover.

### 37. How do animals in the tundra adapt to extreme cold?

A) They migrate to warmer climates

B) They have thick fur and fat layers

C) They hibernate all year

D) They have small bodies

\*\*Correct Answer: B) They have thick fur and fat layers\*\*

\*\*Explanation:\*\* Many tundra animals have thick fur and a layer of fat for insulation against the cold.

### 38. What type of habitat supports a diverse range of bird species?

A) Grassland

B) Forest

C) Desert

D) Urban areas

\*\*Correct Answer: B) Forest\*\*

\*\*Explanation:\*\* Forests provide a variety of niches and resources, supporting a diverse range of bird species.

### 39. How do aquatic organisms adapt to varying water temperatures?

A) They have no adaptations

B) They can change color

C) They may migrate or burrow into the substrate

D) They increase their size

\*\*Correct Answer: C) They may migrate or burrow into the substrate\*\*

\*\*Explanation:\*\* Many aquatic organisms can migrate to more suitable temperatures or burrow into sediments to escape extreme conditions.

### 40. What is a common adaptation of desert plants?

A) Large leaves for photosynthesis

B) Deep roots for water access

C) High water retention in leaves

D) Bright colors for pollination

\*\*Correct Answer: B) Deep roots for water access\*\*

\*\*Explanation:\*\* Desert plants often have deep roots to access underground water sources.

### 41. What type of habitat is characterized by periodic flooding?

A) Grassland

B) Wetland

C) Desert

D) Forest

\*\*Correct Answer: B) Wetland\*\*

\*\*Explanation:\*\* Wetlands experience periodic flooding, providing unique conditions for diverse plant and animal life.

### 42. Which feature helps fish survive in aquatic habitats?

A) Strong legs for swimming

B) Gills for breathing underwater

C) Thick fur for warmth

D) Ability to fly

\*\*Correct Answer: B) Gills for breathing underwater\*\*

\*\*Explanation:\*\* Fish have gills that allow them to extract oxygen from water, enabling them to survive in aquatic environments.

### 43. How do adaptations of organisms in the canopy differ from those on the forest floor?

A) Canopy organisms are larger

B) Canopy organisms have more light exposure

C) Forest floor organisms need more water

D) There is no difference

\*\*Correct Answer: B) Canopy organisms have more light exposure\*\*

\*\*Explanation:\*\* Organisms in the canopy receive more light and have adaptations for climbing and accessing this resource.

### 44. What is a primary characteristic of a freshwater habitat?

A) High salinity

B) Flowing or standing water

C) Constant tidal changes

D) Desert-like conditions

\*\*Correct Answer: B) Flowing or standing water\*\*

\*\*Explanation:\*\* Freshwater habitats include environments with flowing or standing water, such as rivers, ponds, and lakes.

### 45. How do adaptations in the savanna reflect environmental conditions?

A) They are all similar

B) They reflect the need for water and food availability

C) They are primarily for temperature control

D) They focus on avoiding predators

\*\*Correct Answer: B) They reflect the need for water and food availability\*\*

\*\*Explanation:\*\* Adaptations in the savanna often relate to the seasonal availability of water and food resources.

### 46. What adaptation do some fish have for living in fast-moving streams?

A) Flat bodies for gliding

B) Streamlined bodies for reduced resistance

C) Ability to breathe air

D) Large size for intimidation

\*\*Correct Answer: B) Streamlined bodies for reduced resistance\*\*

\*\*Explanation:\*\* Streamlined bodies help fish minimize resistance while swimming in fast-moving water.

### 47. What is a characteristic of organisms in a tundra habitat?

A) High biodiversity

B) Permafrost layer in the soil

C) Dense forests

D) High temperatures

\*\*Correct Answer: B) Permafrost layer in the soil\*\*

\*\*Explanation:\*\* The tundra is characterized by a permanently frozen layer of soil called permafrost.

### 48. How do seasonal changes affect the distribution of organisms in a habitat?

A) They have no effect

B) They can trigger migrations and breeding cycles

C) They only affect temperature

D) They reduce competition

\*\*Correct Answer: B) They can trigger migrations and breeding cycles\*\*

\*\*Explanation:\*\* Seasonal changes can influence migrations and reproductive behaviors, affecting species distribution.

### 49. What is the role of aquatic plants in an ecosystem?

A) They are only food for herbivores

B) They provide oxygen and habitat

C) They have no significant role

D) They compete with fish

\*\*Correct Answer: B) They provide oxygen and habitat\*\*

\*\*Explanation:\*\* Aquatic plants produce oxygen through photosynthesis and provide habitat for various organisms.

### 50. How do adaptations in coastal habitats differ from those in freshwater habitats?

A) Coastal organisms have less competition

B) Coastal organisms must tolerate saltwater

C) Freshwater organisms thrive in saltwater

D) There are no adaptations in coastal habitats

\*\*Correct Answer: B) Coastal organisms must tolerate saltwater\*\*

\*\*Explanation:\*\* Coastal organisms have adaptations to survive in saltwater environments, which differ from those in freshwater habitats.

### 51. What type of vegetation would you expect in a dry grassy field?

A) Dense forests

B) Aquatic plants

C) Grasses and scattered shrubs

D) Mangroves

\*\*Correct Answer: C) Grasses and scattered shrubs\*\*

\*\*Explanation:\*\* Dry grassy fields are typically characterized by grasses and occasional shrubs.

### 52. How does the presence of water influence the distribution of plant species?

A) It has no influence

B) It determines which species can survive

C) It only affects animal distribution

D) It promotes soil erosion

\*\*Correct Answer: B) It determines which species can survive\*\*

\*\*Explanation:\*\* Water availability is crucial for plant survival, influencing the types of species that can thrive in a given area.

### 53. What is a common feature of organisms living in a mangrove habitat?

A) Ability to tolerate high salinity

B) Ability to swim

C) Ability to burrow

D) Large body size

\*\*Correct Answer: A) Ability to tolerate high salinity\*\*

\*\*Explanation:\*\* Organisms in mangrove habitats have adaptations that allow them to cope with high salinity.

### 54. How do animals in a rainforest adapt to high humidity?

A) They have thick fur

B) They have specialized breathing systems

C) They have waterproof skin or feathers

D) They migrate to drier areas

\*\*Correct Answer: C) They have waterproof skin or feathers\*\*

1. **Local (Nigerian) Biomes**

### 1. What is a primary characteristic of the tropical rainforest biome?

A) Low biodiversity

B) High rainfall and humidity

C) Seasonal droughts

D) Sparse vegetation

\*\*Correct Answer: B) High rainfall and humidity\*\*

\*\*Explanation:\*\* Tropical rainforests are characterized by high rainfall and humidity, supporting a diverse range of plant and animal life.

### 2. Where is the Guinea savanna primarily located in Nigeria?

A) Northern Nigeria

B) Southern Nigeria

C) Western Nigeria

D) Eastern Nigeria

\*\*Correct Answer: B) Southern Nigeria\*\*

\*\*Explanation:\*\* The Guinea savanna is predominantly found in southern Nigeria, characterized by grasslands and scattered trees.

### 3. What distinguishes the Sudan savanna from the Guinea savanna?

A) Higher tree density

B) More consistent rainfall

C) Drier conditions and fewer trees

D) Lower animal diversity

\*\*Correct Answer: C) Drier conditions and fewer trees\*\*

\*\*Explanation:\*\* The Sudan savanna is drier than the Guinea savanna and typically has fewer trees.

### 4. Which area in Nigeria is known for its desert biome?

A) Jos Plateau

B) Niger Delta

C) Borno State

D) Ogun State

\*\*Correct Answer: C) Borno State\*\*

\*\*Explanation:\*\* The desert biome in Nigeria is primarily found in the northeastern region, particularly in Borno State.

### 5. What are the highlands of Nigeria characterized by?

A) Tropical rainforests

B) Grasslands and montane forests

C) Deserts

D) Urban areas

\*\*Correct Answer: B) Grasslands and montane forests\*\*

\*\*Explanation:\*\* The highlands, such as the Obudu, Jos, and Mambilla plateaus, are characterized by grasslands and montane forests.

### 6. Which biome is characterized by seasonal rainfall and dry periods?

A) Tropical rainforest

B) Desert

C) Savanna

D) Highland

\*\*Correct Answer: C) Savanna\*\*

\*\*Explanation:\*\* Savannas experience seasonal rainfall with distinct wet and dry periods.

### 7. What type of vegetation is typical in the desert biome of Nigeria?

A) Dense forests

B) Sparse, drought-resistant plants

C) Lush grasslands

D) Aquatic plants

\*\*Correct Answer: B) Sparse, drought-resistant plants\*\*

\*\*Explanation:\*\* The desert biome is characterized by sparse vegetation adapted to dry conditions.

### 8. How does the climate of the tropical rainforest influence its biodiversity?

A) It limits plant growth

B) It promotes high biodiversity due to stable conditions

C) It leads to seasonal migrations

D) It causes frequent fires

\*\*Correct Answer: B) It promotes high biodiversity due to stable conditions\*\*

\*\*Explanation:\*\* The stable climate of the tropical rainforest supports a wide variety of species and complex ecosystems.

### 9. What is the primary factor influencing vegetation in the Guinea savanna?

A) High elevation

B) Seasonal rainfall patterns

C) Saltwater intrusion

D) Urban development

\*\*Correct Answer: B) Seasonal rainfall patterns\*\*

\*\*Explanation:\*\* The Guinea savanna's vegetation is influenced by its seasonal rainfall, which supports grasses and scattered trees.

### 10. Which biome in Nigeria has the highest temperatures and lowest rainfall?

A) Tropical rainforest

B) Guinea savanna

C) Sudan savanna

D) Desert

\*\*Correct Answer: D) Desert\*\*

\*\*Explanation:\*\* The desert biome has the highest temperatures and the lowest rainfall compared to other biomes in Nigeria.

### 11. Which of the following animals would you expect to find in the tropical rainforest?

A) Camels

B) Elephants

C) Monkeys

D) Cheetahs

\*\*Correct Answer: C) Monkeys\*\*

\*\*Explanation:\*\* Monkeys are commonly found in tropical rainforests, where they have access to abundant food and shelter.

### 12. What is a significant environmental issue affecting Nigeria's tropical rainforest?

A) Urbanization

B) Deforestation

C) Desertification

D) Flooding

\*\*Correct Answer: B) Deforestation\*\*

\*\*Explanation:\*\* Deforestation is a major environmental issue threatening the tropical rainforest in Nigeria.

### 13. How do the highlands of Nigeria impact local climate?

A) They create deserts

B) They moderate temperatures and increase rainfall

C) They have no climate impact

D) They lead to urban development

\*\*Correct Answer: B) They moderate temperatures and increase rainfall\*\*

\*\*Explanation:\*\* The highlands can influence local climate by moderating temperatures and enhancing rainfall patterns.

### 14. Which of the following adaptations is common in desert plants?

A) Large leaves

B) Deep roots

C) Bright flowers

D) High moisture content

\*\*Correct Answer: B) Deep roots\*\*

\*\*Explanation:\*\* Desert plants often have deep roots to access water stored underground.

### 15. What type of trees are often found in the Guinea savanna?

A) Evergreen trees

B) Deciduous trees

C) Coniferous trees

D) Mangrove trees

\*\*Correct Answer: B) Deciduous trees\*\*

\*\*Explanation:\*\* Deciduous trees, which shed their leaves during the dry season, are common in the Guinea savanna.

### 16. What is the primary vegetation type found in the Sudan savanna?

A) Dense forests

B) Grasslands with scattered trees

C) Aquatic plants

D) Shrublands

\*\*Correct Answer: B) Grasslands with scattered trees\*\*

\*\*Explanation:\*\* The Sudan savanna is characterized by grasslands interspersed with occasional trees.

### 17. Which animal is commonly associated with the Nigerian desert?

A) Kudu

B) Gazelle

C) Lion

D) Crocodile

\*\*Correct Answer: B) Gazelle\*\*

\*\*Explanation:\*\* Gazelles are well adapted to desert habitats and can be found in Nigeria's arid regions.

### 18. How do animals in the tropical rainforest adapt to their environment?

A) They migrate to avoid heat

B) They develop camouflage and climbing abilities

C) They have thick fur for insulation

D) They burrow underground

\*\*Correct Answer: B) They develop camouflage and climbing abilities\*\*

\*\*Explanation:\*\* Many tropical rainforest animals have adaptations like camouflage and climbing abilities to thrive in the complex environment.

### 19. In which Nigerian biome would you find baobab trees?

A) Tropical rainforest

B) Guinea savanna

C) Sudan savanna

D) Desert

\*\*Correct Answer: C) Sudan savanna\*\*

\*\*Explanation:\*\* Baobab trees are commonly found in the Sudan savanna, where they are adapted to the dry climate.

### 20. What is a significant feature of the Obudu Plateau?

A) It is a desert environment

B) It has high biodiversity and cool climate

C) It is primarily a grassland

D) It is located at sea level

\*\*Correct Answer: B) It has high biodiversity and cool climate\*\*

\*\*Explanation:\*\* The Obudu Plateau is known for its cool climate and high biodiversity, including montane forests.

### 21. How does the climate of the Jos Plateau differ from that of the Guinea savanna?

A) Higher rainfall and cooler temperatures

B) Lower elevation and warmer temperatures

C) Lower biodiversity

D) Higher temperatures and less rainfall

\*\*Correct Answer: A) Higher rainfall and cooler temperatures\*\*

\*\*Explanation:\*\* The Jos Plateau has a cooler climate with higher rainfall compared to the Guinea savanna.

### 22. Which of the following plants is adapted to thrive in the desert biome?

A) Water lilies

B) Cacti

C) Oak trees

D) Ferns

\*\*Correct Answer: B) Cacti\*\*

\*\*Explanation:\*\* Cacti are well adapted to desert conditions, storing water and minimizing moisture loss.

### 23. How does fire influence the Guinea savanna?

A) It has no effect

B) It promotes the growth of certain plants

C) It destroys all vegetation

D) It reduces biodiversity

\*\*Correct Answer: B) It promotes the growth of certain plants\*\*

\*\*Explanation:\*\* Fire can stimulate the growth of fire-adapted species in the Guinea savanna, maintaining the ecosystem.

### 24. What type of climate is typically found in the highlands of Nigeria?

A) Hot and dry

B) Cool and moist

C) Tropical and humid

D) Arid

\*\*Correct Answer: B) Cool and moist\*\*

\*\*Explanation:\*\* The highlands typically have a cooler and more moist climate compared to lower elevations.

### 25. Which animal would you expect to find in the tropical rainforest?

A) Antelope

B) Parrot

C) Lizard

D) All of the above

\*\*Correct Answer: D) All of the above\*\*

\*\*Explanation:\*\* The tropical rainforest supports a diverse range of animals, including mammals, birds, and reptiles.

### 26. What adaptation helps savanna animals survive the dry season?

A) Hibernation

B) Migration to wetter areas

C) Increased body size

D) Burrowing underground

\*\*Correct Answer: B) Migration to wetter areas\*\*

\*\*Explanation:\*\* Many savanna animals migrate to find food and water during dry periods.

### 27. What is a common challenge for organisms living in the desert?

A) Excess moisture

B) Extreme temperatures and limited water

C) Heavy rainfall

D) High humidity

\*\*Correct Answer: B) Extreme temperatures and limited water\*\*

\*\*Explanation:\*\* Organisms in the desert face challenges from extreme heat during the day and limited water availability.

### 28. Which biome is characterized by a mix of grasses and trees?

A) Tropical rainforest

B) Desert

C) Savanna

D) Tundra

\*\*Correct Answer: C) Savanna\*\*

\*\*Explanation:\*\* The savanna biome features a mix of grasses and scattered trees adapted to seasonal rainfall.

### 29. How do highland forests contribute to the local ecosystem?

A) They provide habitat and regulate water cycles

B) They have no significant role

C) They increase erosion

D) They only support animal life

\*\*Correct Answer: A) They provide habitat and regulate water cycles\*\*

\*\*Explanation:\*\* Highland forests support diverse habitats and help regulate local water cycles through precipitation.

### 30. What type of vegetation is typical in the Nigerian desert?

A) Lush forests

B) Cacti and drought-resistant shrubs

C) Aquatic plants

D) Grasses

\*\*Correct Answer: B) Cacti and drought-resistant shrubs\*\*

\*\*Explanation:\*\* The desert in Nigeria is characterized by drought-resistant plants like cacti and shrubs.

### 31. Which of the following species is adapted to the highland forests of Nigeria?

A) Desert tortoise

B) Mountain gorilla

C) Highland monkey

D) Nile crocodile

\*\*Correct Answer: C) Highland monkey\*\*

\*\*Explanation:\*\* Highland monkeys are adapted to the cooler, forested environments found in Nigeria's highlands.

### 32. What is the primary threat to the tropical rainforest in Nigeria?

A) Overgrazing

B) Mining activities

C) Deforestation for agriculture

D) Urbanization

\*\*Correct Answer: C) Deforestation for agriculture\*\*

\*\*Explanation:\*\* Deforestation for agricultural expansion is a major threat to Nigeria's tropical rainforest.

### 33. How does the distribution of plants in the savanna reflect the climate?

A) Plants are evenly distributed

B) Plants are clustered near water sources

C) All plants are drought-resistant

D) There is no relationship

\*\*Correct Answer: B) Plants are clustered near water sources\*\*

\*\*Explanation:\*\* In the savanna, plants tend to cluster around available water sources due to seasonal droughts.

### 34. What adaptation helps animals in the desert to reduce water loss?

A) Thick fur

B) Small body size

C) Nocturnal behavior

D) Bright colors

\*\*Correct Answer: C) Nocturnal behavior\*\*

\*\*Explanation:\*\* Many desert animals are nocturnal, which helps them avoid the heat of the day and reduce water loss.

### 35. Which of the following is a feature of the Sudan savanna?

A) Dense forests

B) High rainfall

C) Grasslands with scattered trees

D) Wetlands

\*\*Correct Answer: C) Grasslands with scattered trees\*\*

\*\*Explanation:\*\* The Sudan savanna is characterized by grasslands interspersed with scattered trees.

### 36. How does climate change impact the biomes of Nigeria?

A) It has no effect

B) It leads to shifts in species distribution and habitat loss

C) It increases biodiversity

D) It stabilizes ecosystems

\*\*Correct Answer: B) It leads to shifts in species distribution and habitat loss\*\*

\*\*Explanation:\*\* Climate change can alter habitats, leading to shifts in species distribution and potential habitat loss.

### 37. What type of soil is commonly found in tropical rainforest biomes?

A) Sandy soil

B) Clay soil

C) Nutrient-rich soil

D) Leached soil

\*\*Correct Answer: D) Leached soil\*\*

\*\*Explanation:\*\* Tropical rainforest soils are often leached, meaning they lose nutrients due to heavy rainfall.

### 38. Which animals are commonly found in the Jos Plateau?

A) Penguins

B) Mountain goats

C) Monkeys and birds

D) Crocodiles

\*\*Correct Answer: C) Monkeys and birds\*\*

\*\*Explanation:\*\* The Jos Plateau is home to various species of monkeys and birds adapted to the highland environment.

### 39. How do the adaptations of savanna plants help them survive?

A) Thick trunks for water storage

B) Shallow roots for quick water access

C) Large leaves for photosynthesis

D) Deep taproots to access underground water

\*\*Correct Answer: D) Deep taproots to access underground water\*\*

\*\*Explanation:\*\* Many savanna plants have deep taproots to access water sources during dry periods.

### 40. What is the main vegetation type in the northern savanna of Nigeria?

A) Dense forest

B) Grassland with few trees

C) Aquatic plants

D) Desert shrubs

\*\*Correct Answer: B) Grassland with few trees\*\*

\*\*Explanation:\*\* The northern savanna is characterized by grasslands with few scattered trees.

### 41. How do highland ecosystems in Nigeria contribute to biodiversity?

A) They have fewer species due to harsh conditions

B) They provide diverse habitats due to elevation changes

C) They are primarily aquatic

D) They only support a few plant species

\*\*Correct Answer: B) They provide diverse habitats due to elevation changes\*\*

\*\*Explanation:\*\* Highland ecosystems support a variety of habitats, contributing to higher biodiversity.

### 42. What adaptations do plants in the desert have to cope with extreme temperatures?

A) Thick leaves

B) Deep roots and water storage

C) Bright flowers

D) Large surface area

\*\*Correct Answer: B) Deep roots and water storage\*\*

\*\*Explanation:\*\* Desert plants often have deep roots to access water and adaptations to store water efficiently.

### 43. How do animals in the tropical rainforest adapt to high humidity?

A) They drink more water

B) They have waterproof adaptations

C) They are nocturnal

D) They burrow underground

\*\*Correct Answer: B) They have waterproof adaptations\*\*

\*\*Explanation:\*\* Many rainforest animals have adaptations to prevent water loss and cope with high humidity.

### 44. What is the usual climatic condition in the Guinea savanna?

A) Very high rainfall

B) Seasonal rainfall with a distinct dry season

C) Constant humidity

D) Extreme temperatures year-round

\*\*Correct Answer: B) Seasonal rainfall with a distinct dry season\*\*

\*\*Explanation:\*\* The Guinea savanna experiences seasonal rainfall, with distinct wet and dry periods.

### 45. Which type of biome is primarily characterized by low rainfall and extreme temperatures?

A) Tropical rainforest

B) Savanna

C) Desert

D) Highland

\*\*Correct Answer: C) Desert\*\*

\*\*Explanation:\*\* Deserts are characterized by low rainfall and extreme temperature variations.

### 46. How do organisms in the savanna adapt to seasonal droughts?

A) They migrate to wetter areas

B) They hibernate

C) They store water in their bodies

D) They reduce activity during dry periods

\*\*Correct Answer: A) They migrate to wetter areas\*\*

\*\*Explanation:\*\* Many savanna animals migrate to find food and water during dry seasons.

### 47. What type of vegetation would you expect in a highland area?

A) Tropical trees

B) Grasslands with scattered trees

C) Coniferous forests

D) Aquatic plants

\*\*Correct Answer: C) Coniferous forests\*\*

\*\*Explanation:\*\* Highland areas often support coniferous forests due to cooler temperatures and specific soil conditions.

### 48. How does the vegetation in the Guinea savanna contribute to soil quality?

A) It depletes nutrients

B) It prevents erosion and adds organic matter

C) It has no effect

D) It reduces moisture

\*\*Correct Answer: B) It prevents erosion and adds organic matter\*\*

\*\*Explanation:\*\* Vegetation in the Guinea savanna helps prevent soil erosion and contributes organic matter through decomposition.

### 49. What adaptation allows animals in a desert to find food?

A) Nocturnal behavior to avoid heat

B) Large body size

C) Bright colors for visibility

D) Ability to dig burrows

\*\*Correct Answer: A) Nocturnal behavior to avoid heat\*\*

\*\*Explanation:\*\* Many desert animals are nocturnal, allowing them to avoid extreme heat while foraging for food.

### 50. What is a defining feature of the Mambilla Plateau?

A) Low elevation

B) High biodiversity and cool climate

C) Desert conditions

D) Urban development

\*\*Correct Answer: B) High biodiversity and cool climate\*\*

\*\*Explanation:\*\* The Mambilla Plateau is characterized by high biodiversity and a cooler climate compared to surrounding areas.

### 51. In which biome would you find the highest tree density?

A) Desert

B) Savanna

C) Tropical rainforest

D) Highland

\*\*Correct Answer: C) Tropical rainforest\*\*

\*\*Explanation:\*\* Tropical rainforests have the highest tree density and biodiversity of any biome.

### 52. How do adaptations in the Sudan savanna reflect environmental conditions?

A) They are all similar

B) They reflect the need for water and food availability

C) They are primarily for temperature control

D) They focus on avoiding predators

\*\*Correct Answer: B) They reflect the need for water and food availability\*\*

\*\*Explanation:\*\* Adaptations in the Sudan savanna help organisms cope with seasonal water availability and food resources.

### 53. Which of the following is a common feature of the Jos Plateau?

A) Tropical rainforest conditions

B) High elevation with cool temperatures

C) Desert vegetation

D) High salinity

\*\*Correct Answer: B) High elevation with cool temperatures\*\*

\*\*Explanation:\*\* The Jos Plateau is known for its high elevation and cooler temperatures compared to surrounding areas.

### 54. What type of soil is typically found in the savanna?

A) Sandy soil

B) Clay soil

C) Loamy soil

D) Nutrient-rich soil

\*\*Correct Answer: C) Loamy soil\*\*

\*\*Explanation:\*\* Savanna soils are often loamy, providing good drainage while retaining some moisture.

1. **The Ecology of Populations**

### 1. What does population density refer to?

A) The total number of organisms in a habitat

B) The number of organisms per unit area

C) The variety of species in an ecosystem

D) The total biomass of an area

\*\*Correct Answer: B) The number of organisms per unit area\*\*

\*\*Explanation:\*\* Population density measures how many individuals of a species are present in a specific area.

### 2. What is overcrowding in ecological terms?

A) A decrease in species diversity

B) A situation where population density exceeds the habitat's capacity

C) A balanced ecosystem

D) An increase in food supply

\*\*Correct Answer: B) A situation where population density exceeds the habitat's capacity\*\*

\*\*Explanation:\*\* Overcrowding occurs when a population's density surpasses the environment's ability to support it, leading to resource depletion.

### 3. Which of the following factors can lead to competition among organisms?

A) Abundant resources

B) Limited food and space

C) Mutualistic relationships

D) High biodiversity

\*\*Correct Answer: B) Limited food and space\*\*

\*\*Explanation:\*\* Competition arises when resources such as food and space are limited, leading to a struggle for survival.

### 4. What is intra-specific competition?

A) Competition between different species

B) Competition within the same species

C) Competition for light

D) Competition for mates

\*\*Correct Answer: B) Competition within the same species\*\*

\*\*Explanation:\*\* Intra-specific competition occurs among individuals of the same species competing for the same resources.

### 5. What is inter-specific competition?

A) Competition for resources among different species

B) Competition within a single species

C) Competition for mates

D) Competition for space

\*\*Correct Answer: A) Competition for resources among different species\*\*

\*\*Explanation:\*\* Inter-specific competition involves different species competing for shared resources in an ecosystem.

### 6. How does competition relate to ecological succession?

A) It has no impact

B) It can inhibit succession

C) It promotes biodiversity

D) It leads to extinction only

\*\*Correct Answer: B) It can inhibit succession\*\*

\*\*Explanation:\*\* Competition can limit species' ability to establish themselves in an area, potentially slowing the process of ecological succession.

### 7. Which of the following is a biotic factor that affects population size?

A) Temperature

B) Space

C) Food availability

D) Light intensity

\*\*Correct Answer: C) Food availability\*\*

\*\*Explanation:\*\* Food availability is a biotic factor that can directly influence population size and growth.

### 8. What is a common abiotic factor affecting population sizes?

A) Predation

B) Competition

C) Temperature

D) Disease

\*\*Correct Answer: C) Temperature\*\*

\*\*Explanation:\*\* Temperature is an abiotic factor that influences the survival and reproduction of organisms in a population.

### 9. What is ecological succession?

A) The movement of organisms

B) The gradual process of change in an ecosystem

C) The competition for resources

D) The extinction of species

\*\*Correct Answer: B) The gradual process of change in an ecosystem\*\*

\*\*Explanation:\*\* Ecological succession refers to the progressive changes in species composition and ecosystem structure over time.

### 10. What is primary succession?

A) Succession that occurs in previously disturbed areas

B) Succession that occurs on barren land without soil

C) Succession that leads to a climax community

D) Succession that involves only plants

\*\*Correct Answer: B) Succession that occurs on barren land without soil\*\*

\*\*Explanation:\*\* Primary succession begins in lifeless areas where soil has not yet formed, such as after a volcanic eruption.

### 11. What is secondary succession?

A) Succession that occurs in a stable ecosystem

B) Succession that occurs after a disturbance that does not destroy the soil

C) Succession leading to barren land

D) Succession that only involves herbivores

\*\*Correct Answer: B) Succession that occurs after a disturbance that does not destroy the soil\*\*

\*\*Explanation:\*\* Secondary succession occurs in areas where a disturbance has cleared the vegetation but left the soil intact.

### 12. How can rapid human population growth affect the environment?

A) It leads to increased biodiversity

B) It causes resource depletion and overcrowding

C) It stabilizes ecosystems

D) It has no effect

\*\*Correct Answer: B) It causes resource depletion and overcrowding\*\*

\*\*Explanation:\*\* Rapid human population growth can result in the overuse of resources, leading to ecological stress and habitat destruction.

### 13. How do you calculate population density?

A) Total number of organisms divided by resource availability

B) Total number of organisms divided by area

C) Total biomass divided by area

D) Total area divided by the number of species

\*\*Correct Answer: B) Total number of organisms divided by area\*\*

\*\*Explanation:\*\* Population density is calculated by dividing the total number of organisms by the area they occupy.

### 14. What can cause a decrease in population size?

A) Increased food supply

B) High reproductive rates

C) Disease outbreaks

D) Favorable environmental conditions

\*\*Correct Answer: C) Disease outbreaks\*\*

\*\*Explanation:\*\* Disease outbreaks can lead to significant declines in population size by increasing mortality rates.

### 15. What is niche differentiation?

A) The extinction of species

B) The division of resources among species to reduce competition

C) The increase of competition in an ecosystem

D) The adaption to similar environments

\*\*Correct Answer: B) The division of resources among species to reduce competition\*\*

\*\*Explanation:\*\* Niche differentiation allows multiple species to coexist by utilizing different resources or habitats, reducing competition.

### 16. How does competition influence species diversity?

A) It reduces diversity

B) It increases diversity

C) It has no impact

D) It only affects certain species

\*\*Correct Answer: A) It reduces diversity\*\*

\*\*Explanation:\*\* High levels of competition can lead to the exclusion of less competitive species, reducing overall diversity.

### 17. What role do abiotic factors play in population dynamics?

A) They have no role

B) They help determine the carrying capacity of an environment

C) They only affect animal populations

D) They promote competition

\*\*Correct Answer: B) They help determine the carrying capacity of an environment\*\*

\*\*Explanation:\*\* Abiotic factors influence the resources available in an environment, thus affecting its carrying capacity and population sizes.

### 18. How does predation affect population sizes?

A) It increases population sizes

B) It stabilizes populations

C) It can decrease prey populations

D) It has no effect on populations

\*\*Correct Answer: C) It can decrease prey populations\*\*

\*\*Explanation:\*\* Predation can significantly reduce the populations of prey species, influencing overall population dynamics.

### 19. What is the climax community in ecological succession?

A) A stage of constant change

B) A stable and mature community

C) A community dominated by weeds

D) A community with low biodiversity

\*\*Correct Answer: B) A stable and mature community\*\*

\*\*Explanation:\*\* A climax community is the final, stable stage of ecological succession, characterized by a diverse and balanced ecosystem.

### 20. How do abiotic factors like rainfall influence population sizes?

A) They have no influence

B) They determine the types of organisms present

C) They only affect plant populations

D) They promote competition

\*\*Correct Answer: B) They determine the types of organisms present\*\*

\*\*Explanation:\*\* Rainfall influences habitat conditions, affecting the types and sizes of populations that can thrive in an area.

### 21. What happens during primary succession after a volcanic eruption?

A) Immediate regrowth of complex plants

B) Pioneer species colonize the area first

C) No species can survive

D) Only animal populations increase

\*\*Correct Answer: B) Pioneer species colonize the area first\*\*

\*\*Explanation:\*\* In primary succession, pioneer species such as lichens and mosses are the first to colonize barren land after a volcanic eruption.

### 22. How does increased competition affect reproductive success?

A) It has no effect on reproduction

B) It generally increases reproductive rates

C) It can decrease reproductive success

D) It only affects mating behaviors

\*\*Correct Answer: C) It can decrease reproductive success\*\*

\*\*Explanation:\*\* Increased competition for resources can limit reproductive success by reducing the availability of food and breeding sites.

### 23. What is the primary factor influencing the carrying capacity of a population?

A) The availability of food and resources

B) The number of predators

C) The reproductive rate

D) The presence of diseases

\*\*Correct Answer: A) The availability of food and resources\*\*

\*\*Explanation:\*\* The carrying capacity of a population is primarily determined by the availability of resources such as food, water, and habitat.

### 24. What is the significance of ecological succession?

A) It leads to a decrease in biodiversity

B) It promotes stability in ecosystems

C) It has no ecological importance

D) It only benefits animal populations

\*\*Correct Answer: B) It promotes stability in ecosystems\*\*

\*\*Explanation:\*\* Ecological succession helps ecosystems develop stability and resilience through gradual changes in species composition.

### 25. How do abiotic factors like temperature and light affect plant populations?

A) They have no effect

B) They determine growth rates and distribution

C) They only affect animal populations

D) They promote competition among plants

\*\*Correct Answer: B) They determine growth rates and distribution\*\*

\*\*Explanation:\*\* Temperature and light are critical abiotic factors that influence plant growth, distribution, and reproductive success.

### 26. What is an example of a biotic factor affecting population size?

A) Climate change

B) Availability of water

C) Disease outbreaks

D) Soil composition

\*\*Correct Answer: C) Disease outbreaks\*\*

\*\*Explanation:\*\* Disease outbreaks are biotic factors that can significantly impact the size of a population by increasing mortality rates.

### 27. How does competition relate to ecological succession?

A) It has no impact

B) It can slow down succession

C) It promotes faster succession

D) It only affects certain species

\*\*Correct Answer: B) It can slow down succession\*\*

\*\*Explanation:\*\* Competition among species can inhibit the establishment of new species, thereby slowing down the process of succession.

### 28. What is the role of decomposers in an ecosystem?

A) They compete with plants

B) They help recycle nutrients

C) They only consume living organisms

D) They have no ecological role

\*\*Correct Answer: B) They help recycle nutrients\*\*

\*\*Explanation:\*\* Decomposers break down dead organic matter, recycling nutrients back into the ecosystem for use by producers.

### 29. What is the primary effect of overcrowding on populations?

A) Increased reproductive rates

B) Resource depletion and increased competition

C) Improved health of individuals

D) Decreased competition

\*\*Correct Answer: B) Resource depletion and increased competition\*\*

\*\*Explanation:\*\* Overcrowding leads to resource depletion and increased competition, which can negatively affect population health.

### 30. Which of the following is a characteristic of primary succession?

A) It occurs in areas with pre-existing soil

B) It follows disturbances like fires

C) It begins on bare rock or barren land

D) It is a rapid process

\*\*Correct Answer: C) It begins on bare rock or barren land\*\*

\*\*Explanation:\*\* Primary succession starts on surfaces like bare rock, where soil has not yet formed.

### 31. How do abiotic factors like pH affect population dynamics?

A) They have no effect

B) They influence the health of organisms

C) They only affect plant populations

D) They promote competition

\*\*Correct Answer: B) They influence the health of organisms\*\*

\*\*Explanation:\*\* pH levels can affect nutrient availability and the overall health of organisms, influencing population dynamics.

### 32. What is the relationship between population density and disease spread?

A) Higher density reduces disease spread

B) Higher density increases disease spread

C) There is no relationship

D) Disease only spreads in low-density populations

\*\*Correct Answer: B) Higher density increases disease spread\*\*

\*\*Explanation:\*\* Higher population density can facilitate the spread of diseases due to closer contact among individuals.

### 33. How does the presence of predators affect prey populations?

A) It increases prey numbers

B) It stabilizes prey populations

C) It decreases prey numbers

D) It has no effect

\*\*Correct Answer: C) It decreases prey numbers\*\*

\*\*Explanation:\*\* Predation typically leads to a decrease in prey populations as predators consume them.

### 34. What is the climax community in ecological succession?

A) The initial stage of succession

B) A stable and mature ecosystem

C) A community dominated by weeds

D) A temporary community

\*\*Correct Answer: B) A stable and mature ecosystem\*\*

\*\*Explanation:\*\* The climax community represents the final stage of succession, characterized by a stable and diverse ecosystem.

### 35. How does light availability affect population sizes in plants?

A) It has no effect

B) It determines growth rates and reproductive success

C) It only affects animal populations

D) It promotes competition

\*\*Correct Answer: B) It determines growth rates and reproductive success\*\*

\*\*Explanation:\*\* Light availability is crucial for photosynthesis, affecting plant growth and population sizes.

### 36. What is a possible consequence of increased population density?

A) Decreased competition

B) Increased food supply

C) Increased stress and disease

D) Enhanced resource availability

\*\*Correct Answer: C) Increased stress and disease\*\*

\*\*Explanation:\*\* Higher population density can lead to increased stress on individuals and a higher likelihood of disease transmission.

### 37. How do seasonal changes impact competition among species?

A) They have no impact

B) They can increase resource availability

C) They can intensify competition for limited resources

D) They only affect plant species

\*\*Correct Answer: C) They can intensify competition for limited resources\*\*

\*\*Explanation:\*\* Seasonal changes can lead to fluctuations in resource availability, intensifying competition among species.

### 38. Which of the following factors contributes to ecological succession?

A) Only biotic factors

B) Only abiotic factors

C) A combination of biotic and abiotic factors

D) None of the above

\*\*Correct Answer: C) A combination of biotic and abiotic factors\*\*

\*\*Explanation:\*\* Both biotic and abiotic factors play roles in driving ecological succession and shaping ecosystems.

### 39. How do invasive species affect local populations?

A) They have no impact

B) They can outcompete native species for resources

C) They promote biodiversity

D) They stabilize local ecosystems

\*\*Correct Answer: B) They can outcompete native species for resources\*\*

\*\*Explanation:\*\* Invasive species often outcompete native species, leading to declines in local populations and biodiversity.

### 40. What is the impact of temperature on population sizes?

A) It has no effect

B) It only affects plant populations

C) It can influence metabolic rates and survival

D) It promotes competition

\*\*Correct Answer: C) It can influence metabolic rates and survival\*\*

\*\*Explanation:\*\* Temperature affects metabolic rates and survival, influencing the sizes of populations.

### 41. Which of the following is an example of secondary succession?

A) Growth on bare rock after a volcanic eruption

B) Regrowth of a forest after a wildfire

C) Colonization of a new island

D) Formation of a new habitat

\*\*Correct Answer: B) Regrowth of a forest after a wildfire\*\*

\*\*Explanation:\*\* Secondary succession occurs after a disturbance like a wildfire, where the soil remains intact.

### 42. How do biotic factors like competition affect reproductive ability?

A) They have no impact

B) They can decrease reproductive success

C) They always increase reproductive rates

D) They solely affect food availability

\*\*Correct Answer: B) They can decrease reproductive success\*\*

\*\*Explanation:\*\* Competition for resources can limit the availability of food and breeding sites, reducing reproductive success.

### 43. What is the primary driver of ecological succession?

A) Random events

B) Changes in species composition over time

C) Climate stability

D) The presence of predators

\*\*Correct Answer: B) Changes in species composition over time\*\*

\*\*Explanation:\*\* Ecological succession is driven by gradual changes in species composition and community structure over time.

### 44. How do abiotic factors like rainfall influence population dynamics?

A) They have no influence

B) They determine habitat conditions and resource availability

C) They only affect plant populations

D) They promote competition

\*\*Correct Answer: B) They determine habitat conditions and resource availability\*\*

\*\*Explanation:\*\* Rainfall influences habitat conditions, which in turn affects the availability of resources for organisms.

### 45. What role does competition play in natural selection?

A) It decreases biodiversity

B) It has no impact

C) It promotes survival of the fittest

D) It only affects reproductive success

\*\*Correct Answer: C) It promotes survival of the fittest\*\*

\*\*Explanation:\*\* Competition can drive natural selection by favoring individuals with advantageous traits for survival and reproduction.

### 46. How does ecological succession lead to a climax community?

A) By random events only

B) Through gradual changes in species composition

C) By eliminating all species

D) By promoting only one species

\*\*Correct Answer: B) Through gradual changes in species composition\*\*

\*\*Explanation:\*\* Ecological succession leads to a climax community through a series of gradual changes in species composition over time.

### 47. What can be a consequence of overcrowding in animal populations?

A) Increased food supply

B) Decreased disease rates

C) Increased competition for resources

D) Enhanced reproductive success

\*\*Correct Answer: C) Increased competition for resources\*\*

\*\*Explanation:\*\* Overcrowding leads to increased competition for limited resources, which can negatively impact population health.

### 48. How do abiotic factors like pH affect aquatic populations?

A) They have no effect

B) They influence species survival and reproduction

C) They only affect plant populations

D) They promote competition

\*\*Correct Answer: B) They influence species survival and reproduction\*\*

\*\*Explanation:\*\* pH levels in water can affect the survival and reproductive success of aquatic organisms.

### 49. How do organisms adapt to reduce intra-specific competition?

A) By increasing population density

B) Through niche differentiation

C) By competing for more resources

D) By forming larger groups

\*\*Correct Answer: B) Through niche differentiation\*\*

\*\*Explanation:\*\* Niche differentiation allows organisms to utilize different resources, reducing competition within the same species.

### 50. What is the primary cause of rapid changes in human populations?

A) Natural disasters

B) Birth and death rates

C) Stable resource availability

D) Urbanization

\*\*Correct Answer: B) Birth and death rates\*\*

\*\*Explanation:\*\* Rapid changes in human populations are primarily driven by variations in birth and death rates.

### 51. How do abiotic factors such as light and temperature affect plant populations?

A) They have no effect

B) They influence photosynthesis and growth

C) They only affect animal populations

D) They promote competition

\*\*Correct Answer: B) They influence photosynthesis and growth\*\*

\*\*Explanation:\*\* Light and temperature are critical abiotic factors that affect photosynthesis, growth, and overall health of plant populations.

1. **SOIL.**

### 1. What type of soil is characterized by large particles and good drainage?

A) Clayey soil

B) Sandy soil

C) Loamy soil

D) Peaty soil

\*\*Correct Answer: B) Sandy soil\*\*

\*\*Explanation:\*\* Sandy soil has large particles, allowing for good drainage and aeration.

### 2. Which type of soil holds water best due to its small particle size?

A) Sandy soil

B) Clayey soil

C) Loamy soil

D) Silty soil

\*\*Correct Answer: B) Clayey soil\*\*

\*\*Explanation:\*\* Clayey soil consists of very small particles, which retain water effectively due to their high surface area.

### 3. What is soil structure?

A) The color of the soil

B) The arrangement of soil particles

C) The mineral content of soil

D) The moisture content of soil

\*\*Correct Answer: B) The arrangement of soil particles\*\*

\*\*Explanation:\*\* Soil structure refers to how soil particles are arranged and organized, influencing water retention and root growth.

### 4. Which soil type has the highest porosity?

A) Sandy soil

B) Loamy soil

C) Clayey soil

D) All soil types have the same porosity

\*\*Correct Answer: B) Loamy soil\*\*

\*\*Explanation:\*\* Loamy soil typically has an optimal balance of sand, silt, and clay, resulting in high porosity and good drainage.

### 5. What is capillarity in soil?

A) Ability of soil to retain heat

B) Ability of soil to retain water through small pores

C) Ability of soil to drain water quickly

D) Ability of soil to support plant roots

\*\*Correct Answer: B) Ability of soil to retain water through small pores\*\*

\*\*Explanation:\*\* Capillarity refers to the movement and retention of water in soil through small pore spaces.

### 6. Humus content in soil is primarily derived from:

A) Inorganic minerals

B) Weathered rock

C) Decomposed organic matter

D) Soil air

\*\*Correct Answer: C) Decomposed organic matter\*\*

\*\*Explanation:\*\* Humus is formed from the decomposition of organic materials, enriching the soil's nutrient content.

### 7. Which of the following is an inorganic component of soil?

A) Humus

B) Plant roots

C) Sand

D) Soil organisms

\*\*Correct Answer: C) Sand\*\*

\*\*Explanation:\*\* Sand is an inorganic component of soil, along with silt and clay, which are mineral particles.

### 8. What role do soil organisms play in the ecosystem?

A) They deplete nutrients

B) They contribute to organic matter and nutrient cycling

C) They have no impact

D) They only affect soil texture

\*\*Correct Answer: B) They contribute to organic matter and nutrient cycling\*\*

\*\*Explanation:\*\* Soil organisms, such as bacteria and fungi, help decompose organic matter, releasing nutrients back into the soil.

### 9. Soil air is important for:

A) Plant respiration and microbial activity

B) Water retention

C) Soil erosion

D) Soil compaction

\*\*Correct Answer: A) Plant respiration and microbial activity\*\*

\*\*Explanation:\*\* Soil air provides oxygen for plant roots and microorganisms, essential for their survival and growth.

### 10. Soil water is crucial for:

A) Erosion

B) Plant growth and nutrient transport

C) Soil compaction

D) Soil structure

\*\*Correct Answer: B) Plant growth and nutrient transport\*\*

\*\*Explanation:\*\* Soil water is vital for plant growth, as it aids in nutrient transport and photosynthesis.

### 11. What is a primary cause of loss of soil fertility?

A) Use of organic fertilizers

B) Repeated cropping with one variety

C) Crop rotation

D) Soil conservation practices

\*\*Correct Answer: B) Repeated cropping with one variety\*\*

\*\*Explanation:\*\* Continuous cropping of the same variety can deplete specific nutrients, leading to a loss of soil fertility.

### 12. How can soil fertility be renewed?

A) Through soil erosion

B) By adding organic matter and fertilizers

C) By leaving the soil bare

D) By planting only one crop

\*\*Correct Answer: B) By adding organic matter and fertilizers\*\*

\*\*Explanation:\*\* Renewing soil fertility can be achieved by adding organic matter and fertilizers, which replenish nutrients.

### 13. What is leaching in the context of soil?

A) The accumulation of nutrients in soil

B) The loss of soluble nutrients through water movement

C) The improvement of soil structure

D) The increase of soil air content

\*\*Correct Answer: B) The loss of soluble nutrients through water movement\*\*

\*\*Explanation:\*\* Leaching refers to the process where water dissolves and removes soluble nutrients from the soil.

### 14. How does soil compaction affect plant growth?

A) It increases water retention

B) It improves aeration

C) It restricts root growth and water infiltration

D) It enhances nutrient availability

\*\*Correct Answer: C) It restricts root growth and water infiltration\*\*

\*\*Explanation:\*\* Soil compaction reduces pore space, limiting root growth and the ability of water to infiltrate the soil.

### 15. What is the primary advantage of using mulch in agriculture?

A) It reduces soil temperature

B) It prevents soil erosion and retains moisture

C) It limits plant growth

D) It increases weed growth

\*\*Correct Answer: B) It prevents soil erosion and retains moisture\*\*

\*\*Explanation:\*\* Mulching helps retain soil moisture and prevent erosion, promoting better soil health.

### 16. Which soil type is considered the best for agriculture due to its balanced properties?

A) Sandy soil

B) Clayey soil

C) Loamy soil

D) Silt soil

\*\*Correct Answer: C) Loamy soil\*\*

\*\*Explanation:\*\* Loamy soil has a balanced mixture of sand, silt, and clay, making it ideal for agricultural use.

### 17. What is the effect of erosion on soil fertility?

A) Erosion increases soil fertility

B) Erosion has no effect

C) Erosion decreases soil fertility

D) Erosion promotes biodiversity

\*\*Correct Answer: C) Erosion decreases soil fertility\*\*

\*\*Explanation:\*\* Erosion removes the topsoil, which is rich in nutrients, leading to decreased soil fertility.

### 18. How can contour plowing benefit soil conservation?

A) It increases soil erosion

B) It helps retain water and reduce runoff

C) It has no effect on soil

D) It compacts the soil

\*\*Correct Answer: B) It helps retain water and reduce runoff\*\*

\*\*Explanation:\*\* Contour plowing follows the natural contours of the land, helping to retain water and reduce erosion.

### 19. What is the purpose of crop rotation?

A) To deplete soil nutrients

B) To improve soil fertility and break pest cycles

C) To increase soil compaction

D) To plant the same crop every year

\*\*Correct Answer: B) To improve soil fertility and break pest cycles\*\*

\*\*Explanation:\*\* Crop rotation enhances soil fertility and disrupts pest cycles by alternating different crop types.

### 20. How can the presence of humus in soil affect its properties?

A) It decreases the water retention capacity

B) It improves soil structure and nutrient content

C) It has no impact

D) It increases soil compaction

\*\*Correct Answer: B) It improves soil structure and nutrient content\*\*

\*\*Explanation:\*\* Humus enhances soil structure, increases nutrient content, and improves moisture retention.

### 21. What is the significance of soil porosity?

A) It has no significance

B) It affects water retention and drainage

C) It only influences soil temperature

D) It determines soil color

\*\*Correct Answer: B) It affects water retention and drainage\*\*

\*\*Explanation:\*\* Soil porosity influences how much water the soil can hold and how well it drains, impacting plant growth.

### 22. How does soil water availability influence plant health?

A) It has no effect

B) It is critical for photosynthesis and nutrient transport

C) It only affects root growth

D) It promotes competition among plants

\*\*Correct Answer: B) It is critical for photosynthesis and nutrient transport\*\*

\*\*Explanation:\*\* Adequate soil water is essential for photosynthesis, nutrient uptake, and overall plant health.

### 23. What is the primary cause of soil compaction?

A) Excessive rainfall

B) Heavy machinery and foot traffic

C) Organic matter addition

D) Crop rotation

\*\*Correct Answer: B) Heavy machinery and foot traffic\*\*

\*\*Explanation:\*\* Soil compaction is primarily caused by heavy machinery and foot traffic compressing soil particles.

### 24. How can shifting cultivation enhance soil fertility?

A) By planting the same crop year after year

B) By allowing land to rest and recover

C) By increasing soil erosion

D) By using only inorganic fertilizers

\*\*Correct Answer: B) By allowing land to rest and recover\*\*

\*\*Explanation:\*\* Shifting cultivation involves rotating fields, allowing previously cultivated land to recover and regain fertility.

### 25. Which factor contributes to the loss of inorganic matter in soil?

A) Mulching

B) Erosion

C) Crop rotation

D) Composting

\*\*Correct Answer: B) Erosion\*\*

\*\*Explanation:\*\* Erosion can wash away inorganic matter from the soil, reducing its fertility and health.

### 26. What is a common characteristic of loamy soil?

A) High sand content

B) High clay content

C) Good drainage and fertility

D) Low nutrient levels

\*\*Correct Answer: C) Good drainage and fertility\*\*

\*\*Explanation:\*\* Loamy soil is known for its balanced texture, providing good drainage and high fertility.

### 27. What is the impact of repeated cropping of one variety on soil?

A) It increases soil fertility

B) It leads to nutrient depletion

C) It has no effect

D) It promotes biodiversity

\*\*Correct Answer: B) It leads to nutrient depletion\*\*

\*\*Explanation:\*\* Repeated cropping of the same variety can deplete specific nutrients, reducing soil fertility over time.

### 28. How does mulching benefit soil health?

A) It increases evaporation

B) It reduces soil temperature and retains moisture

C) It compacts the soil

D) It promotes weed growth

\*\*Correct Answer: B) It reduces soil temperature and retains moisture\*\*

\*\*Explanation:\*\* Mulching helps regulate soil temperature and moisture levels, improving overall soil health.

### 29. What is the relationship between soil fertility and plant growth?

A) Higher fertility leads to stunted growth

B) Lower fertility promotes better growth

C) Higher fertility supports healthier and more productive growth

D) Fertility has no impact on growth

\*\*Correct Answer: C) Higher fertility supports healthier and more productive growth\*\*

\*\*Explanation:\*\* Soil fertility directly affects the availability of nutrients necessary for healthy plant growth.

### 30. How can the practice of terracing help in soil conservation?

A) It increases soil erosion

B) It helps retain soil moisture and reduce runoff

C) It has no impact on soil

D) It promotes urban development

\*\*Correct Answer: B) It helps retain soil moisture and reduce runoff\*\*

\*\*Explanation:\*\* Terracing involves creating flat areas on slopes, which helps retain moisture and reduce soil erosion.

### 31. What role do earthworms play in soil health?

A) They deplete soil nutrients

B) They compact the soil

C) They aerate the soil and break down organic matter

D) They have no role

\*\*Correct Answer: C) They aerate the soil and break down organic matter\*\*

\*\*Explanation:\*\* Earthworms improve soil health by aerating it and contributing to the decomposition of organic matter.

### 32. What is the primary effect of soil erosion on agriculture?

A) Improved crop yields

B) Loss of topsoil and nutrients

C) Increased biodiversity

D) Stabilization of soil

\*\*Correct Answer: B) Loss of topsoil and nutrients\*\*

\*\*Explanation:\*\* Soil erosion removes the nutrient-rich topsoil, negatively impacting agricultural productivity.

### 33. How does the practice of polycropping enhance soil conservation?

A) It reduces biodiversity

B) It promotes the growth of a single crop

C) It increases resilience against pests and improves soil health

D) It has no impact on soil

\*\*Correct Answer: C) It increases resilience against pests and improves soil health\*\*

\*\*Explanation:\*\* Polycropping involves growing multiple crops together, which can enhance soil health and resilience to pests and diseases.

### 34. What is the impact of leaching on soil fertility?

A) It increases fertility

B) It has no effect

C) It decreases fertility by removing nutrients

D) It only affects water retention

\*\*Correct Answer: C) It decreases fertility by removing nutrients\*\*

\*\*Explanation:\*\* Leaching can wash away important nutrients from the soil, reducing its fertility.

### 35. Which soil type is best for retaining water?

A) Sandy soil

B) Clayey soil

C) Loamy soil

D) Silt soil

\*\*Correct Answer: B) Clayey soil\*\*

\*\*Explanation:\*\* Clayey soil has fine particles that retain water effectively due to its small pore spaces.

### 36. What is a major benefit of using organic fertilizers?

A) They deplete nutrients quickly

B) They improve soil structure and fertility

C) They have no impact on soil health

D) They only provide nitrogen

\*\*Correct Answer: B) They improve soil structure and fertility\*\*

\*\*Explanation:\*\* Organic fertilizers enhance soil structure and provide a slow release of nutrients, improving overall soil health.

### 37. How does temperature affect soil organisms?

A) It has no effect

B) It influences their metabolic rates and activity levels

C) It only affects plant growth

D) It promotes competition

\*\*Correct Answer: B) It influences their metabolic rates and activity levels\*\*

\*\*Explanation:\*\* Temperature affects the metabolic rates and activity levels of soil organisms, influencing soil health.

### 38. What is the significance of soil pH for plants?

A) It determines the color of soil

B) It affects nutrient availability

C) It has no effect on plant growth

D) It only influences soil texture

\*\*Correct Answer: B) It affects nutrient availability\*\*

\*\*Explanation:\*\* Soil pH influences the availability of nutrients to plants, affecting their growth and health.

### 39. How can shifting cultivation negatively impact soil?

A) It improves soil fertility

B) It leads to nutrient depletion and erosion

C) It has no impact on soil

D) It promotes biodiversity

\*\*Correct Answer: B) It leads to nutrient depletion and erosion\*\*

\*\*Explanation:\*\* Shifting cultivation can result in nutrient depletion and increased erosion if not managed properly.

### 40. What is the primary goal of soil conservation practices?

A) To increase soil erosion

B) To maintain or improve soil health

C) To promote urbanization

D) To eliminate agricultural practices

\*\*Correct Answer: B) To maintain or improve soil health\*\*

\*\*Explanation:\*\* Soil conservation practices aim to protect and enhance soil health, preventing degradation and loss.

### 41. How does soil structure influence plant root growth?

A) It has no effect

B) Well-structured soil promotes easy root penetration

C) Compacted soil improves root growth

D) Soil structure only affects moisture retention

\*\*Correct Answer: B) Well-structured soil promotes easy root penetration\*\*

\*\*Explanation:\*\* Good soil structure allows roots to penetrate easily, enhancing water and nutrient uptake.

### 42. What is the role of soil air in plant growth?

A) It has no impact

B) It provides oxygen for root respiration

C) It only affects microbial activity

D) It promotes soil erosion

\*\*Correct Answer: B) It provides oxygen for root respiration\*\*

\*\*Explanation:\*\* Soil air is essential for providing oxygen needed by plant roots for respiration.

### 43. How do soil texture and composition affect water retention?

A) They have no effect

B) They determine how well soil can hold water

C) They only affect soil fertility

D) They promote erosion

\*\*Correct Answer: B) They determine how well soil can hold water\*\*

\*\*Explanation:\*\* Soil texture and composition directly influence the soil's capacity to retain water.

### 44. What is the impact of topography on soil formation?

A) It has no impact

B) It can influence drainage and erosion rates

C) It only affects plant growth

D) It stabilizes soil

\*\*Correct Answer: B) It can influence drainage and erosion rates\*\*

\*\*Explanation:\*\* Topography affects how water drains and how soil is eroded, influencing soil formation and characteristics.

### 45. How can contour farming contribute to soil conservation?

A) It promotes soil erosion

B) It reduces water runoff and soil loss

C) It has no impact

D) It eliminates the need for fertilizers

\*\*Correct Answer: B) It reduces water runoff and soil loss\*\*

\*\*Explanation:\*\* Contour farming follows the land's contours, helping to slow water runoff and reduce soil erosion.

### 46. What is a significant consequence of soil compaction?

A) Increased water retention

B) Decreased root growth and aeration

C) Enhanced nutrient availability

D) Improved soil structure

\*\*Correct Answer: B) Decreased root growth and aeration\*\*

\*\*Explanation:\*\* Soil compaction reduces pore space, hindering root growth and limiting soil aeration.

### 47. How does soil erosion affect agricultural productivity?

A) It improves soil fertility

B) It leads to loss of topsoil and nutrients

C) It has no effect

D) It increases crop yields

\*\*Correct Answer: B) It leads to loss of topsoil and nutrients\*\*

\*\*Explanation:\*\* Soil erosion removes nutrient-rich topsoil, negatively impacting agricultural productivity.

### 48. What is the purpose of strip cropping in agriculture?

A) To promote soil erosion

B) To enhance soil conservation and reduce runoff

C) To plant only one crop

D) To eliminate pests

\*\*Correct Answer: B) To enhance soil conservation and reduce runoff\*\*

\*\*Explanation:\*\* Strip cropping involves alternating strips of different crops, which helps conserve soil and reduce water runoff.

### 49. How do organic fertilizers affect soil structure?

A) They degrade soil structure

B) They improve soil structure and aeration

C) They have no effect on soil structure

D) They only provide nutrients

\*\*Correct Answer: B) They improve soil structure and aeration\*\*

\*\*Explanation:\*\* Organic fertilizers enhance soil structure, improving aeration and water retention.

### 50. What is the effect of temperature on soil microbial activity?

A) Higher temperatures decrease activity

B) Temperature has no effect

C) Optimal temperatures increase activity

D) Microbial activity is constant regardless of temperature

\*\*Correct Answer: C) Optimal temperatures increase activity\*\*

\*\*Explanation:\*\* Soil microbial activity generally increases at optimal temperatures, promoting decomposition and nutrient cycling.

### 51. What is the role of mycorrhizal fungi in soil?

A) They compete with plants

B) They help decompose organic matter

C) They enhance nutrient uptake by plant roots

D) They have no ecological role

\*\*Correct Answer: C) They enhance nutrient uptake by plant roots

\*\*Explanation: Mycorrhizal fungi form symbiotic relationships with plant roots, improving nutrient absorption, especially phosphorus.

1. **Humans and Environment**

1. What is an endemic disease?

A) A disease that occurs sporadically

B) A disease that is constantly present in a specific population

C) A disease that spreads rapidly across countries

D) A disease that only affects animals

Correct Answer: B) A disease that is constantly present in a specific population

Explanation: Endemic diseases are consistently found within a particular geographic area or population.

2. Which of the following is a common vector for malaria?

A) Ticks

B) Mosquitoes

C) Flies

D) Fleas

Correct Answer: B) Mosquitoes

Explanation: Malaria is primarily transmitted by the Anopheles mosquito.

3. What is the causative agent of cholera?

A) Virus

B) Bacteria

C) Fungi

D) Protozoa

Correct Answer: B) Bacteria

Explanation: Cholera is caused by the bacterium **Vibrio cholerae**.

4. How is tuberculosis primarily transmitted?

A) Contaminated water

B) Airborne droplets

C) Direct contact

D) Insect bites

Correct Answer: B) Airborne droplets

Explanation: Tuberculosis is transmitted through the inhalation of airborne droplets from an infected person.

5. Which disease is characterized by severe dehydration due to diarrhea?

A) Typhoid fever

B) Cholera

C) Meningitis

D) Syphilis

Correct Answer: B) Cholera

Explanation: Cholera causes severe diarrhea leading to dehydration if not treated promptly.

6. What type of pollution is primarily associated with industrial emissions?

A) Soil pollution

B) Water pollution

C) Air pollution

D) Noise pollution

Correct Answer: C) Air pollution

Explanation: Industrial emissions contribute significantly to air pollution.

7. What is a major source of water pollution?

A) Agricultural runoff

B) Natural disasters

C) Airborne particles

D) Solid waste

Correct Answer: A) Agricultural runoff

Explanation: Agricultural runoff can introduce fertilizers and pesticides into water bodies, causing pollution.

8. What is a common method for controlling air pollution?

A) Deforestation

B) Use of scrubbers in industrial processes

C) Increasing vehicle emissions

D) Burning more fossil fuels

Correct Answer: B) Use of scrubbers in industrial processes

Explanation: Scrubbers remove harmful pollutants from industrial emissions before they enter the atmosphere.

9. What is the primary focus of sanitation?

A) Increasing food production

B) Managing solid waste and sewage disposal

C) Enhancing biodiversity

D) Reducing air pollution

Correct Answer: B) Managing solid waste and sewage disposal

Explanation: Sanitation focuses on the proper management of waste and sewage to promote public health.

10. Which agency is primarily responsible for global health issues?

A) UNICEF

B) World Health Organization (WHO)

C) International Red Cross Society (IRCS)

D) Federal Ministry of Health

Correct Answer: B) World Health Organization (WHO)

Explanation: The WHO is responsible for coordinating international public health efforts.

11. What is the primary purpose of vaccination?

A) To cure diseases

B) To prevent diseases

C) To treat infections

D) To increase population size

Correct Answer: B) To prevent diseases

Explanation: Vaccination helps prevent diseases by stimulating the immune response.

12. Which of the following diseases is transmitted sexually?

A) Cholera

B) Tuberculosis

C) Gonorrhea

D) Meningitis

Correct Answer: C) Gonorrhe\*

Explanation: Gonorrhea is a sexually transmitted disease caused by the bacterium **Neisseria gonorrhoeae.**

13. What are common pollutants found in water?

A) Heavy metals

B) Pesticides

C) Nutrients from fertilizers

D) All of the above

Correct Answer: D) All of the above

Explanation: Heavy metals, pesticides, and nutrients from fertilizers are all common water pollutants.

14. How does pollution affect biodiversity?

A) It increases biodiversity

B) It has no effect

C) It can lead to habitat destruction and species decline

D) It promotes species interactions

Correct Answer: C) It can lead to habitat destruction and species decline\*

Explanation: Pollution can degrade habitats, leading to a decline in biodiversity.

15. What is the main effect of soil pollution on agriculture?

A) It improves crop yields

B) It has no impact

C) It reduces soil fertility

D) It increases plant diversity

Correct Answer: C) It reduces soil fertility

Explanation: Soil pollution can introduce harmful substances that reduce soil fertility and crop productivity.

16. How does leaching affect soil health?

A) It increases nutrient levels

B) It removes essential nutrients from the soil

C) It has no effect

D) It improves soil structure

Correct Answer: B) It removes essential nutrients from the soil

Explanation: Leaching can wash away vital nutrients, leading to reduced soil fertility.

17. What is a common consequence of poor sanitation?

A) Improved public health

B) Increased disease transmission

C) Enhanced food security

D) Reduced waste generation

Correct Answer: B) Increased disease transmission

Explanation: Poor sanitation can lead to the spread of diseases due to contamination of water and food.

18. How can solid waste management contribute to environmental health?

A) It has no impact

B) It increases pollution

C) It prevents pollution and public health hazards

D) It creates more waste

Correct Answer: C) It prevents pollution and public health hazards

Explanation: Effective solid waste management reduces pollution and protects public health.

### 19. What type of conservation focuses on protecting specific species and their habitats?

A) Sustainable development

B) Wildlife conservation

C) Soil conservation

D) Water conservation

Correct Answer: B) Wildlife conservation

Explanation: Wildlife conservation aims to protect endangered species and their habitats.

20. What is the purpose of national parks and game reserves?

A) To promote urban development

B) To protect biodiversity and natural habitats

C) To increase agricultural production

D) To support industrial activities

Correct Answer: B) To protect biodiversity and natural habitats

Explanation:\*\* National parks and game reserves are established to conserve biodiversity and protect natural ecosystems.

21. How does deforestation impact the environment?

A) It increases oxygen levels

B) It reduces biodiversity and contributes to climate change

C) It has no effect

D) It promotes soil health

Correct Answer: B) It reduces biodiversity and contributes to climate change\*

Explanation\* Deforestation leads to habitat loss, reduced biodiversity, and increased carbon dioxide levels in the atmosphere.

22. What is the main goal of the United Nations Environmental Programme (UNEP)?

A) To promote economic growth

B) To coordinate global environmental activities

C) To improve agricultural practices

D) To support urbanization

Correct Answer: B) To coordinate global environmental activities

Explanation: UNEP focuses on coordinating international efforts to address environmental issues.

23. Which of the following practices helps in soil conservation?

A) Overgrazing

B) Contour farming

C) Deforestation

D) Monocropping

Correct Answer: B) Contour farming

Explanation\* Contour farming involves plowing along the contours of the land, which helps reduce soil erosion.

24. What is the primary focus of the Nigerian Conservation Foundation (NCF)?

A) To promote urban development

B) To protect Nigeria's natural resources and biodiversity

C) To increase agricultural production

D) To manage industrial waste

Correct Answer: B) To protect Nigeria's natural resources and biodiversity

Explanation: The NCF works to conserve Nigeria's biological diversity and natural resources.

25. How do common pollutants like heavy metals affect human health?

A) They enhance immune function

B) They can lead to serious health issues, including cancer

C) They have no impact

D) They only affect plants

Correct Answer: B) They can lead to serious health issues, including cancer

Explanation: Heavy metals can accumulate in the body and lead to various health problems, including cancer.

26. What is the purpose of community health programs?

A) To promote industrial growth

B) To improve public health and sanitation

C) To increase pollution

D) To support urbanization

Correct Answer: B) To improve public health and sanitation

Explanation: Community health programs aim to enhance public health through education and improved sanitation practices.

27. How does overfishing impact marine ecosystems?

A) It promotes biodiversity

B) It leads to the decline of fish populations and ecosystem imbalance

C) It has no effect

D) It increases fish sizes

Correct Answer: B) It leads to the decline of fish populations and ecosystem imbalance

Explanation: Overfishing can deplete fish populations, disrupting marine food webs and ecosystem stability.

28. What is the primary benefit of using organic fertilizers?

A) They increase soil toxicity

B) They improve soil structure and nutrient content

C) They have no effect on soil health

D) They promote soil erosion

Correct Answer: B) They improve soil structure and nutrient content

Explanation: Organic fertilizers enhance soil health by improving structure and adding essential nutrients.

29. What is the effect of urbanization on natural habitats?

A) It enhances biodiversity

B) It leads to habitat destruction and fragmentation

C) It has no impact

D) It promotes conservation

Correct Answer: B) It leads to habitat destruction and fragmentation

Explanation: Urbanization often results in the loss of natural habitats, threatening biodiversity.

30. How can education contribute to environmental conservation?

A) It has no significance

B) It raises awareness and promotes sustainable practices

C) It only promotes industrial growth

D) It decreases community involvement

Correct Answer: B) It raises awareness and promotes sustainable practices

Explanation: Education plays a critical role in fostering awareness and encouraging sustainable environmental practices.

31. What is the consequence of solid waste accumulation?

A) Improved community health

B) Increased pollution and health hazards

C) Enhanced aesthetic appeal

D) Higher soil fertility

Correct Answer: B) Increased pollution and health hazards\*\*

Explanation: Accumulation of solid waste can lead to pollution and pose serious health risks to communities.

32. How does climate change affect soil health?

A) It has no effect

B) It can lead to erosion and nutrient loss

C) It improves soil fertility

D) It stabilizes soil moisture

Correct Answer: B) It can lead to erosion and nutrient loss

Explanation: Climate change can exacerbate erosion and lead to the loss of essential nutrients in the soil.

33. What is the primary purpose of sewage treatment plants?

A) To increase pollution

B) To treat and purify wastewater before release

C) To promote industrial waste disposal

D) To eliminate solid waste

Correct Answer: B) To treat and purify wastewater before release

Explanation: Sewage treatment plants are designed to remove contaminants from wastewater before it is released into the environment.

34. Which of the following is a renewable natural resource?

A) Fossil fuels

B) Timber from sustainably managed forests

C) Minerals

D) Soil

Correct Answer: B) Timber from sustainably managed forests

Explanation: Timber from sustainably managed forests is considered a renewable resource because it can be replenished over time.

35. How do agricultural practices impact soil fertility?

A) They always improve soil fertility

B) They can lead to nutrient depletion if not managed properly

C) They have no effect

D) They only benefit certain crops

Correct Answer: B) They can lead to nutrient depletion if not managed properly

Explanation: Unsustainable agricultural practices can deplete soil nutrients and reduce fertility over time.

36. What is the primary method of controlling soil erosion on slopes?

A) Deforestation

B) Terracing

C) Overgrazing

D) Monocropping

Correct Answer: B) Terracing

Explanation: Terracing involves creating flat areas on slopes to reduce erosion and manage water off.

37. Which of the following diseases is caused by a virus?

A) Gonorrhea

B) Tuberculosis

C) AIDS

D) Cholera

Correct Answer: C) AIDS

Explanation: AIDS is caused by the Human Immunodeficiency Virus (HIV).

38. How does soil temperature affect plant growth?

A) It has no impact

B) It influences seed germination and root development

C) It only affects flowering

D) It decreases moisture retention

Correct Answer: B) It influences seed germination and root development

Explanation: Soil temperature is crucial for seed germination and the development of plant roots.

39. What is the primary goal of conservation practices?

A) To increase pollution

B) To sustain natural resources for future generations

C) To promote urban development

D) To eliminate wildlife

Correct Answer: B) To sustain natural resources for future generations

Explanation: Conservation practices aim to protect and sustainably manage natural resources for future use.

40. How does the presence of pollutants in water affect aquatic life?

A) It enhances biodiversity

B) It can lead to death and reduced populations

C) It has no effect

D) It increases nutrient levels

Correct Answer: B) It can lead to death and reduced populations

Explanation: Pollutants in water can be toxic to aquatic organisms, leading to population declines.

41. What is the role of the Federal Ministry of Environment in Nigeria?

A) To promote urbanization

B) To manage and protect the environment and natural resources

C) To increase industrial activities

D) To support agricultural expansion

Correct Answer: B) To manage and protect the environment and natural resources

Explanation: The Federal Ministry of Environment is responsible for environmental protection and sustainable resource management in Nigeria.

42. How can personal hygiene contribute to public health?

A) It has no significance

B) It reduces the transmission of diseases

C) It promotes environmental degradation

D) It increases pollution

Correct Answer: B) It reduces the transmission of diseases

Explanation: Good personal hygiene practices help prevent the spread of infectious diseases.

43. What is the primary consequence of deforestation?

A) Increased biodiversity

B) Habitat loss and increased carbon emissions

C) Improved soil fertility

D) Enhanced water retention

Correct Answer: B) Habitat loss and increased carbon emissions

Explanation: Deforestation leads to habitat destruction and contributes to higher carbon emissions, impacting climate change.

44. How does overgrazing affect soil health?

A) It improves nutrient levels

B) It leads to soil compaction and erosion

C) It has no effect

D) It increases biodiversity

Correct Answer: B) It leads to soil compaction and erosion

Explanation: Overgrazing can compact the soil and lead to erosion, degrading soil health.

45. What is the primary aim of environmental education?

A) To increase pollution

B) To promote awareness and sustainable practices

C) To eliminate conservation efforts

D) To enhance industrial growth

Correct Answer: B) To promote awareness and sustainable practices\*\*

Explanation: Environmental education aims to raise awareness about environmental issues and promote sustainable practices.

46. How does urbanization impact natural resources?

A) It conserves resources

B) It leads to increased consumption and depletion

C) It has no effect

D) It promotes biodiversity

Correct Answer: B) It leads to increased consumption and depletion

Explanation: Urbanization often results in greater consumption of natural resources, leading to their depletion.

47. What is the role of the International Union for Conservation of Nature (IUCN)?

A) To promote industrial development

B) To coordinate international conservation efforts

C) To increase pollution

D) To eliminate wildlife

Correct Answer: B) To coordinate international conservation efforts

Explanation: The IUCN works globally to promote conservation and sustainable use of natural resources.

48. Which disease is caused by a protozoan parasite?

A) Tuberculosis

B) Malaria

C) Gonorrhea

D) Cholera

Correct Answer: B) Malaria

Explanation: Malaria is caused by the protozoan parasite **Plasmodium**, transmitted by mosquitoes.

49. What is a common method for controlling water pollution?

A) Increasing industrial waste disposal

B) Treating wastewater before release

C) Allowing runoff without treatment

D) Ignoring regulations

Correct Answer: B) Treating wastewater before release

Explanation: Treating wastewater helps remove contaminants before it is released into water bodies, reducing pollution.

50. How do common pollutants like plastics affect the environment?

A) They enhance soil health

B) They can cause harm to wildlife and ecosystems

C) They have no effect

D) They increase biodiversity

Correct Answer: B) They can cause harm to wildlife and ecosystems

Explanation: Plastics can be ingested by animals and can disrupt ecosystems, leading to environmental degradation.

51. What is the significance of maintaining biodiversity?

A) It has no importance

B) It supports ecosystem stability and resilience

C) It only benefits humans

D) It reduces competition

Correct Answer: B) It supports ecosystem stability and resilience

Explanation:\*\* Biodiversity contributes to the stability and resilience of ecosystems, allowing them to adapt to changes.

52. How does the practice of shifting cultivation affect soil?

A) It improves soil fertility

B) It can lead to nutrient depletion and erosion

C) It has no impact

D) It promotes biodiversity

Correct Answer: B) It can lead to nutrient depletion and erosion

Explanation: Shifting cultivation can deplete nutrients if land is not allowed to regenerate properly.

53. What is the primary goal of the World Wildlife Foundation (WWF)?

A) To promote urban development

B) To conserve nature and reduce the most pressing threats to the diversity of life on Earth

C) To increase industrial activities

D) To eliminate wildlife conservation efforts

Correct Answer: B) To conserve nature and reduce the most pressing threats to the diversity of life on Earth

Explanation: WWF focuses on conservation efforts to protect wildlife and their habitats globally.

54. How does soil pollution affect agricultural practices?

A) It increases crop yields

B) It has no effect

C) It reduces soil fertility and crop productivity

D) It promotes biodiversity

Correct Answer: C) It reduces soil fertility and crop productivity

Explanation: Soil pollution can introduce toxins that diminish soil fertility, negatively impacting crop yields.

**D:Heredity and Variations.**

1. **Variation In Population**

1. What is variation in a population?

A) Differences in genetic makeup

B) Differences in physical appearance and characteristics among individuals

C) The same traits in all individuals

D) A lack of genetic diversity

Correct Answer: B) Differences in physical appearance and characteristics among individuals

Explanation: Variation refers to the differences in traits among individuals within a population.

2. Which of the following is an example of morphological variation?

A) Ability to taste PTC

B) Blood group types

C) Height and weight differences

D) Fingerprint patterns

Correct Answer: C) Height and weight differences

Explanation: Morphological variation includes physical traits such as height and weight.

3. What type of variation is represented by blood groups?

A) Discontinuous variation

B) Continuous variation

C) Physiological variation

D) Environmental variation

Correct Answer: A) Discontinuous variation

Explanation: Blood groups represent distinct categories rather than a range, making them an example of discontinuous variation.

4. What is continuous variation?

A) Variation with distinct categories

B) Variation that can be measured on a spectrum

C) Variation that is not influenced by genetics

D) Variation with no environmental influence

Correct Answer: B) Variation that can be measured on a spectrum

Explanation: Continuous variation occurs when traits exhibit a range of values, such as height or skin color.

5. Which of the following is an example of physiological variation?

A) Fingerprint patterns

B) Eye color

C) Ability to roll the tongue

D) Height

Correct Answer: C) Ability to roll the tongue

Explanation: Physiological variation refers to differences in the functioning of individuals, such as the ability to roll the tongue.

6. How does the environment influence variation in a population?

A) It has no effect

B) It can alter the expression of traits

C) It only affects physical traits

D) It leads to genetic mutations

Correct Answer: B) It can alter the expression of trait\*

Explanation: Environmental factors can influence how genetic traits are expressed, contributing to variation.

7. What is the significance of fingerprints in identification?

A) They are not unique

B) They are not useful for crime detection

C) They provide a reliable means of individual identification

D) They change over time

Correct Answer: C) They provide a reliable means of individual identification

Explanation: Fingerprints are unique to each individual, making them valuable for identification purposes.

8. What is the role of genetic constitution in variation?

A) It has no relationship to variation

B) It determines the range of possible traits in a population

C) It only affects physical traits

D) It leads to environmental changes

Correct Answer: B) It determines the range of possible traits in a population

Explanation: The genetic constitution of individuals influences the traits that can be expressed, contributing to variation.

9. Which blood group is known as the universal donor?

A) A

B) B

C) AB

D) O

Correct Answer: D) O

Explanation: Blood group O is considered the universal donor because it can be given to individuals of any blood type.

10. How can variations in height and weight be measured in a population?

A) By visual observation only

B) By using statistical methods and tools

C) By guessing

D) By measuring only one individual

Correct Answer: B) By using statistical methods and tool\*

Explanation: Height and weight can be accurately measured and analyzed using statistical methods for a population.

11. Which of the following is a characteristic of discontinuous variation?

A) It shows a range of phenotypes

B) It has distinct categories

C) It is influenced by environmental factors

D) It is continuous

Correct Answer: B) It has distinct categories

Explanation: Discontinuous variation is characterized by distinct groups with no intermediate forms.

12. What is the primary method of using blood groups in paternity testing?

A) Visual inspection

B) Genetic compatibility analysis

C) Blood pressure measurement

D) Skin color comparison

Correct Answer: B) Genetic compatibility analysis

Explanation: Blood group analysis can help determine paternity by checking for compatibility between parents and child.

13. How can height and weight data be plotted?

A) As a pie chart

B) As a bar graph

C) As a frequency distribution graph

D) As a line graph

Correct Answer: C) As a frequency distribution graph

Explanation: Frequency distribution graphs are used to show the spread of height and weight data in a population.

14. What type of variation is represented by eye color?

A) Continuous variation

B) Discontinuous variation

C) Physiological variation

D) Environmental variation

Correct Answer: B) Discontinuous variation

Explanation: Eye color is an example of discontinuous variation because it falls into distinct categories.

15. Which factor is NOT a type of variation?

A) Morphological variation

B) Physiological variation

C) Genetic variation

D) Social variation

Correct Answer: D) Social variation

Explanation: While social behaviors may vary, they do not constitute a biological type of variation like the others listed.

16. What is an example of a common physiological variation among humans?

A) Height

B) Blood group

C) Fingerprint patterns

D) Hair color

Correct Answer: B) Blood group

Explanation: Blood groups represent a physiological variation among individuals.

17. How can one identify ecological conditions that favor disease spread?

A) By studying genetic sequences

B) By observing environmental factors like water and climate

C) By measuring blood pressure

D) By analyzing muscle strength

Correct Answer: B) By observing environmental factors like water and climate

Explanation: Understanding the ecological conditions, such as water availability and climate, can help identify factors that favor disease spread.

18. What is the primary cause of variation in fingerprint patterns?

A) Environmental factors

B) Genetic factors

C) Nutritional factors

D) Age

Correct Answer: B) Genetic factors

Explanation: Fingerprint patterns are primarily determined by genetic factors, making them unique to each individual.

19. How is the ability to taste PTC inherited?

A) It is influenced by environmental factors only

B) It is a simple Mendelian trait

C) It has no genetic basis

D) It requires multiple genes

Correct Answer: B) It is a simple Mendelian trait

Explanation: The ability to taste PTC is inherited as a dominant trait according to Mendelian genetics.

20. What is the impact of environmental conditions on physiological variations?

A) They have no impact

They can enhance or inhibit certain traits

C) They only affect physical traits

D) They lead to genetic mutations

Correct Answer: B) They can enhance or inhibit certain traits

Explanation: Environmental conditions can influence the expression of physiological traits, enhancing or inhibiting them.

21. What is the significance of studying variations in a population?

A) It has no significance

B) It helps in understanding evolutionary processes

C) It only benefits agriculture

D) It promotes genetic uniformity

Correct Answer: B) It helps in understanding evolutionary processes

Explanation:Studying variations provides insights into evolutionary adaptations and population dynamics.

22. How can one categorize people according to their physiological variation?

A) By height only

B) By blood group and ability to taste PTC

C) By social status

D) By eye color only

Correct Answer: B) By blood group and ability to taste PTC

Explanation: People can be categorized based on distinct physiological traits such as blood group and the ability to taste PTC.

23. What is the primary method of using discontinuous variation in crime detection?

A) Visual identification

B) DNA profiling and fingerprint analysis

C) Blood pressure measurement

D) Weight analysis

Correct Answer: B) DNA profiling and fingerprint analysis

Explanation: Discontinuous variation, such as fingerprints and DNA, is crucial in forensic science for crime detection.

24. Which of the following diseases is transmitted through vectors?

A) Tuberculosis

B) Malaria

C) AIDS

D) Cholera

Correct Answer: B) Malaria

Explanation: Malaria is transmitted by the Anopheles mosquito, making it a vector-borne disease.

25. What is the significance of blood transfusion compatibility?

A) It has no significance

B) It prevents allergic reactions and complications

C) It increases blood pressure

D) It enhances immune response

Correct Answer: B) It prevents allergic reactions and complications

Explanation: Ensuring blood transfusion compatibility is essential to prevent adverse reactions in recipients.

26. How can environmental conditions lead to the spread of diseases like malaria?

A) By increasing genetic diversity

B) By creating breeding grounds for mosquitoes

C) By reducing pollution

D) By improving sanitation

Correct Answer: B) By creating breeding grounds for mosquitoes

Explanation: Stagnant water and warm climates provide ideal breeding conditions for mosquitoes, increasing malaria transmission.

27. Which of the following is NOT a factor influencing variation in a population?

A) Genetic constitution

B) Environmental conditions

C) Social interactions

D) Random mutations

Correct Answer: C) Social interactions

Explanation: While social interactions can influence behavior, they do not directly cause biological variation in traits.

28. How do variations in height and weight correlate with health?

A) They have no correlation

B) They can indicate nutritional status and health risk

C) They only affect physical appearance

D) They are irrelevant to health

Correct Answer: B) They can indicate nutritional status and health risk

Explanation: Variations in height and weight often reflect an individual's nutritional status and potential health risks.

29. What is the primary focus of genetic studies in human populations?

A) To eliminate variations

B) To understand the inheritance of traits and diseases

C) To promote uniformity

D) To increase environmental impacts

Correct Answer: B) To understand the inheritance of traits and diseases

Explanation: Genetic studies aim to explore how traits and diseases are inherited within populations.

30. What is a common method for measuring physiological variation?

A) Visual inspection

B) Blood tests and genetic analysis

C) Height measurement only

D) Guessing

Correct Answer: B) Blood tests and genetic analysis

Explanation: Blood tests and genetic analysis provide accurate information on physiological variations such as blood type and genetic traits.

31. What type of variation is most relevant for forensic science?

A) Continuous variation

B) Discontinuous variation

C) Physiological variation

D) Environmental variation

Correct Answer: B) Discontinuous variation

Explanation\* Discontinuous variation, such as fingerprints and blood types, is crucial for identification in forensic science.

32. How can environmental factors affect physiological traits?

A) They have no effect

B) They can enhance or inhibit trait expression

C) They only affect physical traits

D) They promote genetic mutations

Correct Answer: B) They can enhance or inhibit trait expression

Explanation: Environmental factors can influence how physiological traits are expressed in individuals.

33. Which of the following best describes a phenotype?

A) The genetic makeup of an organism

B) The observable traits of an organism

C) The environmental influences on an organism

D) The evolutionary history of an organism

Correct Answer: B) The observable traits of an organism

Explanation:\*\* A phenotype refers to the physical expression of traits in an organism, influenced by genetics and environment.

34. What is the significance of measuring variations in a population?

A) It has no significance

B) It helps in understanding population dynamics and health

C) It only benefits agriculture

D) It promotes genetic uniformity

Correct Answer: B) It helps in understanding population dynamics and health

Explanation:\*\*easuring variations provides insights into health, genetics, and environmental adaptations within populations.

35. How does the ability to taste PTC exemplify discontinuous variation?

A) It shows a range of tasting abilities

B) It can be categorized into tasters and non-tasters

C) It is influenced by environmental factors

D) It is irrelevant to genetics

Correct Answer: B) It can be categorized into tasters and non-taster

Explanation: The ability to taste PTC is a clear example of discontinuous variation, with distinct categories based on genetic inheritance.

36. How can knowledge of blood groups assist in medical procedures?

A) It has no relevance

B) It helps in determining compatibility for transfusions

C) It promotes genetic diversity

D) It only affects physical traits

Correct Answer: B) It helps in determining compatibility for transfusions\*

Explanation:\*Understanding blood groups is essential for ensuring safe and compatible blood transfusions.

37. What is the primary role of environmental conditions in determining variations?

A) They have no role

B) They influence the expression of genetic traits

C) They only affect physical appearance

D) They lead to genetic mutations

Correct Answer: B) They influence the expression of genetic traits

Explanation: Environmental conditions can significantly affect how genetic traits are expressed in individuals.

38. How can variations in a population be categorized?

A) Only by physical traits

B) By morphological and physiological traits

C) By social status

D) By geographical location only

Correct Answer: B) By morphological and physiological traits

Explanation: Variations in a population can be categorized into morphological (physical) and physiological (functional) traits.

39. What is an example of a common environmental factor influencing variation?

A) Genetic mutation

B) Climate and availability of resources

C) Social interactions

D) Random chance

Correct Answer: B) Climate and availability of resource\*

Explanation: Environmental factors, such as climate and resource availability, significantly influence variations in populations.

40. How does the ability to roll the tongue serve as an example of physiological variation?

A) It shows a range of abilities

B) It can be categorized into rollers and non-rollers

C) It is influenced by environmental factors

D) It has no genetic basis

Correct Answer: B) It can be categorized into rollers and non-rollers\*

Explanation:\*\* The ability to roll the tongue is a genetic trait that can be distinctly categorized.

41. What is the primary benefit of understanding genetic variation in populations?

A) It promotes uniformity

B) It aids in disease prevention and management

C) It has no significance

D) It only benefits agriculture

Correct Answer: B) It aids in disease prevention and management

Explanation:\*\* Understanding genetic variation helps identify susceptibility to diseases and informs prevention strategies.

42. How can the practice of fingerprint classification assist in crime detection?

A) It has no relevance

B) It provides a unique identifier for individuals

C) It increases the number of suspects

D) It only identifies physical traits

Correct Answer: B) It provides a unique identifier for individuals

Explanation: Fingerprints are unique to each person, making them invaluable for identifying individuals in forensic investigations.

43. How do height and weight variations reflect health in a population?

A) They have no correlation

B) They indicate nutritional status and potential health risks

C) They only affect physical appearance

D) They are irrelevant to health

Correct Answer: B) They indicate nutritional status and potential health risks

Explanation: Variations in height and weight can provide insights into the nutritional health of individuals within a population.

44. Which of the following is an example of continuous variation?

A) Blood type

B) Height

C) Tongue rolling ability

D) Fingerprint patterns

Correct Answer: B) Height

Explanation: Height is a trait that exhibits a range of values, making it an example of continuous variation.

45. How can the study of variations contribute to agricultural practices?

A) It has no significance

B) It helps in breeding programs for improved traits

C) It only benefits urban development

D) It promotes uniformity in crops

Correct Answer: B) It helps in breeding programs for improved traits

Explanation: Studying variations allows breeders to select for desirable traits, enhancing agricultural productivity.

46. What is the significance of environmental impact assessments?

A) They have no significance

B) They help identify potential effects of development on biodiversity

C) They promote industrial growth

D) They only focus on economic factors

Correct Answer: B) They help identify potential effects of development on biodiversity

Explanation: Environmental impact assessments evaluate how proposed projects may affect the environment and biodiversity.

47. How do common pollutants affect human health?

A) They have no impact

B) They can cause respiratory issues and other health problems

C) They enhance immune function

D) They only affect animals

Correct Answer: B) They can cause respiratory issues and other health problems

Explanation: Exposure to pollutants can lead to various health issues, including respiratory problems and increased disease susceptibility.

48. How does genetic variation affect a population's adaptability?

A) It has no effect

B) It enhances the population's ability to adapt to changing environments

C) It reduces adaptability

D) It only benefits certain individuals

Correct Answer: B) It enhances the population's ability to adapt to changing environments

Explanation: Genetic variation provides the raw material for natural selection, allowing populations to adapt to environmental changes.

49. What is the role of public health education in disease prevention?

A) It has no significance

B) It promotes awareness of health practices and disease prevention

C) It increases disease transmission

D) It only focuses on environmental factors

Correct Answer: B) It promotes awareness of health practices and disease prevention

Explanation : Public health education is crucial for informing communities about practices that can prevent disease.

50. How can variations be used in conservation efforts?

A) They have no relevance

B) They help identify genetically diverse populations for protection

C) They only focus on physical traits

D) They eliminate the need for conservation

Correct Answer: B) They help identify genetically diverse populations for protection

Explanation: Understanding variations can guide conservation strategies to protect genetically diverse populations that are more resilient.

51. What is an advantage of using genetic markers in crime detection?

A) They are not unique

B) They provide a specific identifier for individuals

C) They increase the number of suspects

D) They have no relevance

Correct Answer: B) They provide a specific identifier for individuals

Explanation: Genetic markers are unique to each individual and can be used to accurately identify suspects in forensic investigations.

1. **Heredity**

1. What are heritable characters?

A) Traits that cannot be passed to offspring

B) Traits that can be passed from parents to offspring

C) Traits influenced by environmental factors

D) Traits that are always dominant

Correct Answer: B) Traits that can be passed from parents to offspring\*\*

Explanation: Heritable characters are those traits that can be transmitted genetically from one generation to the next.

2. Which of the following is a non-heritable character?

A) Eye color

B) Height

C) Language spoken

D) Blood type

Correct Answer: C) Language spoken

Explanation: Language is learned behavior and not genetically inherited, making it a non-heritable character.

3. What is the structure of DNA primarily composed of?

A) Amino acids

B) Nucleotides

C) Fatty acids

D) Sugars

Correct Answer: B) Nucleotides

Explanation: DNA is made up of nucleotides, which consist of a sugar, a phosphate group, and a nitrogenous base.

4. What is the primary function of chromosomes?

A) To produce energy

B) To carry genetic information

C) To facilitate photosynthesis

D) To provide structural support

Correct Answer: B) To carry genetic information

Explanation: Chromosomes contain DNA, which carries the genetic instructions for the development and functioning of organisms.

5. How are hereditary characters transmitted from parents to offspring?

A) Through environmental factors only

B) Through genes located on chromosomes

C) Through learned behaviors

D) Through dietary habits

Correct Answer: B) Through genes located on chromosomes

Explanation: Hereditary characters are transmitted via genes that reside on chromosomes.

6. What occurs during meiosis that contributes to genetic variation?

A) DNA replication only

B) Segregation and recombination of genes

C) Cell division only

D) Mutation only

Correct Answer: B) Segregation and recombination of genes

Explanation: Meiosis involves the segregation of homologous chromosomes and the recombination of genetic material, leading to genetic diversity.

7. What is the probability of obtaining a homozygous recessive offspring from a monohybrid cross of two heterozygous parents?

A) 25%

B) 50%

C) 75%

D) 100%

Correct Answer: A) 25%

Explanation: In a monohybrid cross (Aa x Aa), there is a 1 in 4 chance (25%) of producing a homozygous recessive offspring (aa).

8. What is a sex-linked characteristic?

A) A trait that is inherited independently of sex

B) A trait that is carried on a sex chromosome

C) A trait that only males can express

D) A trait that is always dominant

Correct Answer: B) A trait that is carried on a sex chromosome

Explanation: Sex-linked characteristics are determined by genes located on the sex chromosomes (X or Y).

9. Which of the following is an example of a sex-linked trait?

A) Height

B) Blood type

C) Color blindness

D) Hair color

Correct Answer: C) Color blindness

Explanation: Color blindness is a trait linked to the X chromosome, making it a sex-linked trait.

10. What is the significance of using recombinant DNA technology?

A) It has no significance

B) It allows for the production of important medical products

C) It only benefits agricultural practices

D) It increases biodiversity

Correct Answer: B) It allows for the production of important medical products

Explanation: Recombinant DNA technology is used to produce essential medical products such as insulin and enzymes.

11. What is the primary advantage of outbreeding?

A) Increased risk of genetic disorders

B) Higher genetic diversity and vigor

C) Decreased adaptability

D) Reduced fertility

Correct Answer: B) Higher genetic diversity and vigor

Explanation: Outbreeding usually increases genetic diversity, which can enhance vigor and adaptability in offspring.

12. How does inbreeding affect a population?

A) It increases genetic diversity

B) It decreases the likelihood of inheriting genetic disorders

C) It can lead to an increase in recessive genetic disorders

D) It has no impact on health

Correct Answer: C) It can lead to an increase in recessive genetic disorders

Explanation: Inbreeding can increase the risk of recessive genetic disorders due to the higher likelihood of mating between closely related individuals.

13. Which of the following diseases is an example of a sex-linked disorder?

A) Sickle-cell anemia

B) Hemophilia

C) Cystic fibrosis

D) Tay-Sachs disease

Correct Answer: B) Hemophilia

Explanation: Hemophilia is a sex-linked disorder caused by a mutation on the X chromosome.

14. How can the principles of heredity be applied in agriculture?

A) By using only one crop variety

B) Through selective breeding for desirable traits

C) By avoiding genetic analysis

D) By eliminating all pesticides

Correct Answer: B) Through selective breeding for desirable traits

Explanation: Farmers can apply heredity principles by selectively breeding plants and animals to enhance desirable characteristics.

15. What is the primary method of determining paternity using blood groups?

A) Visual inspection

B) Blood compatibility analysis

C) Genetic sequencing

D) Height comparison

Correct Answer: B) Blood compatibility analysis

Explanation: Blood group analysis helps determine paternity by checking for compatibility between potential parents and the child.

16. What is the result of gene recombination during fertilization?

A) Increased genetic uniformity

B) Genetic variation in offspring

C) Decreased likelihood of mutations

D) Stabilization of traits

Correct Answer: B) Genetic variation in offspring

Explanation: Gene recombination during fertilization introduces genetic variation, resulting in diverse traits in offspring.

17. What is a characteristic of genetically modified organisms (GMOs)?

A) They have not been altered in any way

B) They are created through natural selection

C) They contain genes that have been artificially introduced

D) They are always harmful to health

Correct Answer: C) They contain genes that have been artificially introduced

Explanation: GMOs have specific genes inserted to enhance certain traits, such as pest resistance or increased yield.

18. How do sex-linked traits typically manifest in males?

A) They are always dominant

B) They can show recessive traits more frequently due to having one X chromosome

C) They have no effect in males

D) They only appear in females

Correct Answer: B) They can show recessive traits more frequently due to having one X chromosom

Explanation: Males have only one X chromosome, so if they inherit a recessive trait linked to the X chromosome, they will express it.

19. What is the significance of blood typing in transfusions?

A) It has no significance

B) It ensures compatibility to prevent adverse reactions

C) It only focuses on blood pressure

D) It increases blood production

Correct Answer: B) It ensures compatibility to prevent adverse reactions

Explanation: Blood typing is crucial for ensuring that transfusions do not result in harmful immune reactions.

20. Which process involves the segregation of genes?

A) DNA replication

B) Meiosis

C) Mitosis

D) Fertilization

Correct Answer: B) Meiosi

Explanation: Meiosis is the process where homologous chromosomes separate, leading to the segregation of genes.

21. How can genetic variation be analyzed in a population?

A) By measuring only physical traits

B) Through cross-breeding experiments and data analysis

C) By guessing

D) By observing social behavior

Correct Answer: B) Through cross-breeding experiments and data analysis

Explanation: Cross-breeding experiments and analyzing the resulting offspring can reveal patterns of genetic variation.

22. What is the role of alleles in genetics?

A) They are identical to each other

B) They are different forms of a gene

C) They have no significance

D) They only affect physical traits

Correct Answer: B) They are different forms of a gene

Explanation: Alleles are different variants of a gene that can produce different traits.

23. What is the outcome of fertilization?

A) Formation of a zygote

B) Division of cells

C) DNA replication

D) Mutation

Correct Answer: A) Formation of a zygote

Explanation: Fertilization results in the formation of a zygote, which contains genetic material from both parents.

24. Which of the following is NOT a characteristic of sex-linked traits?

A) They are often found on the X chromosome

B) They can be passed from mothers to sons

C) They affect only males

D) They can show different incidence rates in males and females

Correct Answer: C) They affect only males

Explanation: While sex-linked traits can be more prevalent in males, they can also be expressed in females.

25. What is the significance of using recombinant DNA in medicine?

A) It has no significance

B) It allows for the production of therapeutic proteins

C) It only benefits agriculture

D) It reduces genetic diversity

Correct Answer: B) It allows for the production of therapeutic proteins

Explanation\* Recombinant DNA technology enables the production of important medical products, such as insulin and hormones.

26. How does the environment influence genetic expression?

A) It has no influence

B) It can modify how traits are expressed

C) It only affects physical traits

D) It promotes uniformity

Correct Answer: B) It can modify how traits are expressed

Explanation:Environmental factors can influence the expression of genetic traits, affecting how they appear in individuals.

#27. What is the common method for studying inheritance patterns?

A) Cross-breeding experiments

B) Visual inspection

C) Guessing

D) Height comparison

Correct Answer: A) Cross-breeding experiments\*\*

Explanation: Cross-breeding experiments are used to study inheritance patterns and predict the traits of offspring.

28. How can knowledge of heredity assist in marriage counseling?

A) It has no relevance

B) It helps assess genetic compatibility and potential health issues

C) It only focuses on social compatibility

D) It promotes uniformity

Correct Answer: B) It helps assess genetic compatibility and potential health issues

Explanation: understanding heredity can help couples assess risks related to genetic disorders, such as sickle-cell anemia.

29. What is the significance of using genetic markers in paternity testing?

A) They are not unique

B) They provide a means to verify parentage

C) They have no relevance

D) They only identify physical traits

Correct Answer: B) They provide a means to verify parentage

Explanation: Genetic markers are unique to individuals and can accurately determine paternity through comparison.

30. Which of the following can be considered a disadvantage of genetically modified organisms (GMOs)?

A) Increased crop yield

B) Reduced pesticide use

C) Potential unforeseen health effects

D) Improved nutritional content

Correct Answer: C) Potential unforeseen health effects

Explanation: GMOs may pose potential health risks that are not yet fully understood, leading to public concern.

31. What is the result of recombination during meiosis?

A) Identical offspring

B) Genetic diversity in gametes

C) Increased mutation rates

D) Reduced genetic variation

Correct Answer: B) Genetic diversity in gametes

Explanation: Recombination during meiosis increases genetic diversity by mixing alleles from both parents.

32. How can blood types be used in forensic science?

A) They have no use

B) They can help determine identity

C) They only identify physical traits

D) They promote genetic uniformity

Correct Answer: B) They can help determine identity

Explanation: Blood type analysis can provide information for identifying individuals in forensic cases.

33. What is the primary role of sex chromosomes?

A) To produce energy

B) To determine an individual's sex

C) To facilitate photosynthesis

D) To provide structural support

Correct Answer: B) To determine an individual's sex

Explanation: Sex chromosomes (X and Y) play a key role in determining the biological sex of an individual.

34. What is the primary consequence of genetic mutations?

A) Increased uniformity

B) Introduction of new traits

C) Decreased biodiversity

D) Elimination of traits

Correct Answer: B) Introduction of new traits

Explanation: Genetic mutations can introduce new traits into a population, contributing to variation.

35. How does the probability of inheritance work in genetics?

A) It is random and unpredictable

B) It can be calculated based on parental genotypes

C) It is always 100%

D) It only applies to dominant traits

Correct Answer: B) It can be calculated based on parental genotypes

Explanation: The probability of inheritance can be predicted using Punnett squares and knowledge of parental genotypes.

36. What is the significance of studying genetic disorders?

A) It has no significance

B) It helps in developing treatments and preventive measures

C) It only benefits agriculture

D) It promotes uniformity

Correct Answer: B) It helps in developing treatments and preventive measures

Explanation: Understanding genetic disorders aids in creating treatments and prevention strategies for affected individuals.

37. How can the principles of heredity contribute to livestock improvement?

A) By promoting genetic uniformity

B) Through selective breeding for desirable traits

C) By eliminating all genetic variation

D) By increasing environmental factors

Correct Answer: B) Through selective breeding for desirable traits

Explanation: Applying heredity principles allows farmers to selectively breed livestock for traits such as size, growth rate, and disease resistance.

38. What is the role of a pedigree chart in genetics?

A) To display the physical traits of individuals

B) To show the inheritance pattern of traits within a family

C) To measure environmental effects

D) To list blood types

Correct Answer: B) To show the inheritance pattern of traits within a family

Explanation: A pedigree chart illustrates how traits are passed through generations in a family.

39. How can environmental conditions influence genetic expression?

A) They have no effect

B) They can enhance or suppress certain traits

C) They only affect physical traits

D) They promote genetic mutations

Correct Answer: B) They can enhance or suppress certain traits\*\*

Explanation:Environmental factors can influence how genetic traits are expressed, leading to variation in phenotype.

40. Which of the following best describes the concept of gene segregation?

A) Genes are always dominant

B) Alleles are separated during gamete formation

C) Genes combine randomly

D) All traits are inherited together

Correct Answer: B) Alleles are separated during gamete formation

Explanation: Gene segregation refers to the separation of alleles during meiosis, resulting in gametes with different combinations of alleles.

41. How is the Rhesus factor related to blood groups?

A) It has no relation

B) It is an additional antigen that can affect compatibility

C) It is only found in females

D) It is irrelevant to transfusions

Correct Answer: B) It is an additional antigen that can affect compatibility

Explanation: The Rhesus factor is an antigen that can affect blood compatibility during transfusions and pregnancy.

42. What is the primary advantage of using genetically modified crops?

A) They have no benefits

B) They can increase yield and resistance to pests

C) They only benefit certain farmers

D) They reduce biodiversity

Correct Answer: B) They can increase yield and resistance to pests

Explanation: GM crops are engineered to enhance yield and provide resistance to pests and diseases.

43. How does the study of heredity aid in understanding evolution?

A) It has no significance

B) It provides insights into how traits are passed and adapted over time

C) It only affects agriculture

D) It promotes uniformity

Correct Answer: B) It provides insights into how traits are passed and adapted over time

Explanation: Studying heredity helps explain the mechanisms of trait inheritance and how they contribute to evolutionary changes.

44. How does the ability to roll the tongue serve as a genetic trait?

A) It has no genetic basis

B) It is a dominant trait determined by a single gene

C) It is influenced only by environmental factors

D) It is a learned behavior

Correct Answer: B) It is a dominant trait determined by a single gene

Explanation: The ability to roll the tongue is often considered a simple Mendelian trait, with dominant and recessive alleles.

45. What is the function of the Y chromosome?

A) It carries genes for eye color

B) It determines male sex characteristics

C) It has no role in sex determination

D) It is identical in males and females

Correct Answer: B) It determines male sex characteristics

Explanation: The Y chromosome is responsible for the development of male sex characteristics in humans.

46. How does the study of genetic variation contribute to medicine?

A) It has no relevance

B) It helps in understanding and treating genetic disorders

C) It only benefits agriculture

D) It promotes uniformity in treatments

Correct Answer: B) It helps in understanding and treating genetic disorders

Explanation: Researching genetic variation aids in the understanding and development of treatments for genetic disorders.

47. What is the significance of using recombinant DNA in agriculture?

A) It has no significance

B) It allows for the development of crops with desirable traits

C) It only benefits livestock

D) It reduces crop yields

Correct Answer: B) It allows for the development of crops with desirable traits

Explanation: Recombinant DNA technology enables the enhancement of crops to possess traits like pest resistance and increased yield.

48. What is the primary characteristic of sex-linked traits?

A) They are inherited independently of sex

B) They are located on the sex chromosomes

C) They can only be expressed in males

D) They are always dominant

Correct Answer: B) They are located on the sex chromosomes

Explanation: Sex-linked traits are determined by genes located on the sex chromosomes (X or Y).

49. How can genetic markers assist in medical diagnostics?

A) They have no relevance

B) They help identify genetic predispositions to diseases

C) They only identify physical traits

D) They promote uniformity

**Correct Answer: B)** They help identify genetic predispositions to diseases

**Explanation:** Genetic markers can indicate an individual’s risk of developing certain genetic disorders.

**E:Evolution**

1. **Theories of evolution**

1. What is organic evolution?

A) Change in individuals over a short period

B) The sum total of adaptive changes in populations over long periods

C) Unchanging species over time

D) Evolution caused solely by environmental factors

**Correct Answer: B)** The sum total of adaptive changes in populations over long period\*

**Explanation**: Organic evolution refers to the cumulative changes in populations of organisms over time, leading to biodiversity.

#2. Which theory proposed that organisms evolve through the inheritance of acquired characteristics?

A) Darwin's theory

B) Lamarck's theory

C) Modern synthesis

D) Natural selection

**Correct Answer: B)** Lamarck's theory

**Explanation:** Lamarck's theory posited that traits acquired during an organism's lifetime could be passed on to its offspring.

3. What is Darwin's theory of evolution primarily based on?

A) Use and disuse of traits

B) Natural selection

C) Inheritance of acquired traits

D) Environmental changes

**Correct Answer: B) Natural selection**

**Explanation**: Darwin's theory emphasized that individuals with favorable traits are more likely to survive and reproduce, passing those traits to the next generation.

4. Which of the following provides evidence for evolution through fossil records?

A) Fossils show that species remain unchanged over time

B) Fossils demonstrate transitional forms between species

C) Fossils are only found in specific locations

D) Fossils do not provide information about past organisms

**Correct Answer: B**) Fossils demonstrate transitional forms between species

**Explanation**: Fossil records reveal transitional species that illustrate the gradual changes that occur over time.

5. What is comparative anatomy?

A) The study of fossils

B) The study of the structure of different organisms

C) The study of genetic differences

D) The study of behavior in animals

C**orrect Answer: B)** The study of the structure of different organisms

E**xplanation:** Comparative anatomy examines similarities and differences in the anatomy of various species, providing evidence for common ancestry.

6. How does embryology provide evidence for evolution?

A) Embryos of different species look completely different

B) Embryos of different species show similarities in early development stages

C) Embryos have no relevance to evolution

D) Embryonic development is unaffected by genetics

**Correct Answer: B)** Embryos of different species show similarities in early development stages

**Explanation:** Similarities in embryonic development among different species suggest a common ancestry.

7. What role do mutations play in evolution?

A) They have no effect on evolution

B) They introduce genetic variation into a population

C) They always lead to harmful effects

D) They only occur in plants

**Correct Answer: B)** They introduce genetic variation into a population

**Explanation**: Mutations are a source of genetic variation, which can be acted upon by natural selection.

8. Which of the following is a key component of Darwin’s theory of natural selection?

A) All traits are equally advantageous

B) Organisms produce more offspring than can survive

C) Evolution happens only in small populations

D) Environmental factors do not influence survival

**Correct Answer: B**) Organisms produce more offspring than can survive

**Explanation**: This leads to competition for resources, where only the fittest individuals survive and reproduce.

9. How can genetic studies support modern evolutionary theory?

A) By demonstrating that species do not change

B) By showing genetic similarities among different species

C) By revealing that mutations are irrelevant

D) By proving that evolution is impossible

**Correct Answer: B)** By showing genetic similarities among different species

**Explanation**: Genetic studies reveal the genetic relationships and similarities between species, supporting the concept of common ancestry.

10. In Lamarck's theory, what is meant by "use and disuse"?

A) Traits are inherited only if they are beneficial

B) Traits that are used become stronger, while those not used weaken

C) Only physical traits can change

D) Evolution happens only in response to environmental changes

**Correct Answer: B**) Traits that are used become stronger, while those not used weaken

**Explanation**: Lamarck proposed that the use of traits enhances them, while disuse leads to their deterioration over generations.

11. What is one piece of evidence for evolution from comparative physiology?

A) All organisms have identical organs

B) Similarities in biochemical processes among different species

C) Differences in environmental adaptations

D) Unrelated organisms have the same lifespan

**Correct Answer: B)** Similarities in biochemical processes among different species

**Explanation:** Similar biochemical pathways indicate a shared evolutionary history among diverse organisms.

12. What is the primary focus of the theory of evolution?

A) To explain the origin of life

B) To describe how species change over time

C) To outline the structure of DNA

D) To categorize all organisms

**Correct Answer: B**) To describe how species change over time

**Explanation**: The theory of evolution focuses on understanding the processes and mechanisms by which species evolve.

13. How does the fossil record provide evidence for evolution?

A) It shows that all species are identical

B) It demonstrates that species have remained unchanged

C) It provides a timeline of species changes and adaptations

D) It has no relevance to evolutionary studies

**Correct Answer: C)** It provides a timeline of species changes and adaptations

**Explanation:** The fossil record reveals how species have changed over time, showing transitional forms and adaptations.

14. Which of the following best describes Darwin's concept of "survival of the fittest"?

A) Only the strongest survive

B) The most adaptable organisms survive and reproduce

C) All organisms have equal chances of survival

D) Fitness is determined solely by size

**Correct Answer: B)** The most adaptable organisms survive and reproduce

**Explanation:** "Survival of the fittest" refers to the idea that those best adapted to their environment are more likely to survive and reproduce.

15. What is the significance of genetic drift in evolution?

A) It has no significance

B) It can lead to changes in allele frequencies in small populations

C) It always increases genetic diversity

D) It is only relevant to large populations

**Correct Answer: B)** It can lead to changes in allele frequencies in small populations

**Explanation:** Genetic drift can cause random changes in allele frequencies, particularly in small populations.

16. What evidence supports the theory of evolution through comparative embryology?

A) All embryos look identical

B) Similarities in early developmental stages among different species

C) Differences in adult forms

D) Embryos do not develop any structures

C**orrect Answer: B)** Similarities in early developmental stages among different species

**Explanation**: similar embryonic development patterns indicate a common ancestry among different species.

17. What does the term "adaptive radiation" refer to?

A) The extinction of species

B) Rapid evolution of diverse species from a common ancestor

C) The migration of species

D) The stabilization of traits

**Correct Answer: B)** Rapid evolution of diverse species from a common ancestor

**Explanation: A**daptive radiation occurs when a single ancestor species diversifies into a variety of forms adapted to different environments.

18. Which of the following is NOT a piece of evidence for evolution?

A) Fossil records

B) Comparative anatomy

C) Supernatural explanations

D) Molecular biology

**Correct Answer: C)** Supernatural explanations

**Explanation:** Scientific evidence for evolution is based on observable data, whereas supernatural explanations are not scientifically validated.

19. How does the study of mutations contribute to our understanding of evolution?

A) It has no impact

B) It helps explain how new traits arise in populations

C) It only focuses on harmful mutations

D) It eliminates the need for natural selection

**Correct Answer: B)** It helps explain how new traits arise in populations

**Explanation**: Mutations introduce new genetic variations, which can be acted upon by natural selection.

20. What is the role of environmental pressures in natural selection?

A) They have no effect

B) They determine which traits are advantageous

C) They only affect physical traits

D) They eliminate all variations

**Correct Answer: B**) They determine which traits are advantageous\*\*

**Explanation:** Environmental pressures influence which traits are favored in a population, guiding the process of natural selection.

21. How do homologous structures provide evidence for evolution?

A) They show that all organisms are identical

B) They indicate common ancestry despite differing functions

C) They are only found in mammals

D) They prove that evolution does not occur

**Correct Answer: B)** They indicate common ancestry despite differing functions

**Explanation**: Homologous structures, such as the forelimbs of mammals, reveal evolutionary relationships among species.

22. What is the significance of the Hardy-Weinberg principle?

A) It describes the process of evolution

B) It predicts genetic variation in a population

C) It has no relevance to evolution

D) It only applies to plants

**Correct Answer: B)** It predicts genetic variation in a population

**Explanation:** The Hardy-Weinberg principle provides a mathematical model to understand genetic variation and equilibrium in populations.

23. Which of the following is a limitation of Lamarck's theory?

A) It emphasizes genetic inheritance

B) It does not account for genetic mutations

C) It is based on empirical evidence

D) It accurately describes adaptation

**Correct Answer: B)** It does not account for genetic mutations

**Explanation:** Lamarck's theory fails to consider the role of genetic mutations in the process of evolution.

24. What is the primary role of mutations in evolutionary processes?

A) They have no impact on evolution

B) They introduce new genetic variations

C) They only lead to diseases

D) They stabilize existing traits

**Correct Answer: B)** They introduce new genetic variations

Explanation: Mutations are a key source of genetic diversity, providing material for natural selection to act upon.

25. How does the fossil record demonstrate transitional forms?

A) All fossils are identical

B) Fossils show gradual changes between species

C) Fossils do not provide evidence for evolution

D) Fossils only show fully developed species

**Correct Answer: B**) Fossils show gradual changes between species

**Explanation:** Transitional fossils illustrate the gradual evolution of one species into another over time.

26. What is the significance of phylogenetic trees in evolutionary biology?

A) They have no significance

B) They represent genetic similarity among organisms

C) They illustrate relationships and common ancestry among species

D) They only focus on physical traits

Correct Answer: C) They illustrate relationships and common ancestry among species

**Explanation:** Phylogenetic trees depict the evolutionary relationships and lineage of different species.

27. Which of the following is an example of convergent evolution?

A) Similar adaptations in unrelated species

B) Divergence from a common ancestor

C) Development of homologous structures

D) Evolution of species in isolation

**Correct Answer: A)** Similar adaptations in unrelated species

**Explanation**: Convergent evolution occurs when different species evolve similar traits due to similar environmental pressures.

28. How can comparative DNA analysis support evolutionary theory?

A) It shows that all organisms are identical

B) It reveals genetic similarities that indicate common ancestry

C) It has no relevance

D) It focuses solely on physical traits

**Correct Answer: B**) It reveals genetic similarities that indicate common ancestry

**Explanation:** Comparative DNA analysis shows genetic relationships among species, supporting the idea of common ancestry.

29. What is the primary mechanism of evolutionary change?

A) Environmental stability

B) Natural selection

C) Random mating

D) Genetic uniformity

**Correct Answer: B)** Natural selection

**Explanation:** Natural selection is the primary mechanism driving evolutionary change by favoring traits that enhance survival and reproduction.

30. What is an example of directional selection?

A) Stabilizing traits becoming more common

B) A shift toward a particular phenotype

C) Traits becoming more diverse

D) No change in traits over time

**Correct Answer: B)** A shift toward a particular phenotype

**Explanation:** Directional selection favors individuals with a specific phenotype, leading to a shift in the population's traits.

31. How does genetic variation contribute to a population's resilience?

A) It reduces adaptability

B) It provides a diverse pool of traits for selection

C) It only benefits certain individuals

D) It has no impact on survival

**Correct Answer: B)** It provides a diverse pool of traits for selection

**Explanation:** Genetic variation allows populations to adapt to changing environments, enhancing their resilience.

32. What is the role of reproductive isolation in speciation?

A) It has no role

B) It prevents gene flow between populations

C) It increases genetic similarity

D) It only occurs in animals

**Correct Answer: B)** It prevents gene flow between populations

**Explanation:** Reproductive isolation prevents different populations from interbreeding, allowing for the development of new species.

33. What is the significance of the "biogeography" in evolutionary studies?

A) It has no significance

B) It examines the distribution of species and ecosystems

C) It only focuses on physical traits

D) It eliminates the need for genetic studies

**Correct Answer: B)** It examines the distribution of species and ecosystems

**Explanation:** Biogeography studies how species are distributed geographically, providing insights into their evolutionary history.

34. How can the study of ancient DNA contribute to our understanding of evolution?

A) It provides no useful information

B) It helps trace lineage and evolutionary relationships

C) It only focuses on living species

D) It promotes genetic uniformity

**Correct Answer: B)** It helps trace lineage and evolutionary relationships

**Explanation:** Ancient DNA analysis can reveal genetic information from extinct species, aiding in understanding evolutionary relationships.

35. Which of the following is an example of stabilizing selection?

A) Increased diversity in traits

B) Favoring intermediate phenotypes

C) Shift toward one extreme phenotype

D) No changes in trait distribution

**Correct Answer: B)** Favoring intermediate phenotypes

**Explanation**: Stabilizing selection favors intermediate traits, reducing variation and maintaining the status quo in a population.

36. What is the function of a mutation in evolutionary biology?

A) To create new species

B) To introduce genetic variation

C) To eliminate traits

D) To stabilize existing traits

**Correct Answer: B)** To introduce genetic variation

**Explanation:** Mutations are a source of new genetic variation, which can be acted upon by natural selection.

37. How does adaptive radiation occur?

A) When species become extinct

B) When one species diversifies into many forms to exploit different environments

C) When species remain stable over time

D) When species interbreed

**Correct Answer: B**) When one species diversifies into many forms to exploit different environments

**Explanation:** Adaptive radiation occurs when a single ancestral species rapidly diversifies into a variety of forms to adapt to different ecological niches.

38. Which of the following provides the best evidence for common descent?

A) Similarities in dietary habits

B) Fossil records showing transitional forms

C) Differences in habitat

D) Variations in size

**Correct Answer: B)** Fossil records showing transitional forms

**Explanation:** Fossil records that document transitional forms provide compelling evidence for common descent among species.

39. What is the role of phenotypic plasticity in evolution?

A) It has no role

B) It allows organisms to adapt to environmental changes

C) It eliminates genetic variation

D) It only affects physical traits

**Correct Answer: B**) It allows organisms to adapt to environmental changes

Explanation: Phenotypic plasticity enables organisms to adjust their traits in response to environmental changes, aiding survival.

40. How do scientists use molecular clocks in evolutionary studies?

A) To measure time

B) To estimate divergence times between species based on genetic mutations

C) To identify fossil ages

D) To predict future mutations

**Correct Answer: B)** To estimate divergence times between species based on genetic mutations

**Explanation**: Molecular clocks utilize the rate of genetic mutations to estimate when two species diverged from a common ancestor.

41. What is the primary difference between homologous and analogous structures?

A) Homologous structures are identical; analogous are different

B) Homologous structures have a common ancestry; analogous do not

C) Analogous structures are more important

D) There is no difference

**Correct Answer: B**) Homologous structures have a common ancestry; analogous do not

**Explanation:** Homologous structures arise from a common ancestor, while analogous structures evolve independently to serve similar functions.

42. How does the concept of fitness relate to natural selection?

A) Fitness is determined by size only

B) Fitness refers to an organism's ability to survive and reproduce in its environment

C) Fitness has no relevance to evolution

D) Fitness is constant in all environments

**Correct Answer: B**) Fitness refers to an organism's ability to survive and reproduce in its environment

**Explanation:** The concept of fitness is central to natural selection, as it determines which individuals are more likely to pass on their traits.

43. What is the significance of the Galápagos Islands in Darwin's studies?

A) They showed that evolution does not occur

B) They provided diverse ecosystems with unique species

C) They had no impact on his theories

D) They only focused on plant life

**Correct Answer: B)** They provided diverse ecosystems with unique species

**Explanation:** The Galápagos Islands' unique species and ecosystems were pivotal in shaping Darwin's ideas about natural selection and adaptation.

44. How does gene flow occur between populations?

A) Through mutation only

B) Through the movement of individuals and their genetic material

C) It has no effect on evolution

D) Only through natural selection

**Correct Answer: B)** Through the movement of individuals and their genetic material

**Explanation**: Gene flow occurs when individuals migrate between populations, introducing new genetic material and increasing genetic diversity.

45. What is the impact of environmental changes on evolution?

A) They have no impact

B) They drive natural selection and adaptations

C) They only affect physical structures

D) They lead to genetic uniformity

**Correct Answer: B)** They drive natural selection and adaptations

**Explanation**: Environmental changes create pressures that can lead to natural selection, resulting in adaptations over time.

46. What is the main purpose of phylogenetic analysis?

A) To categorize organisms by size

B) To determine evolutionary relationships among species

C) To study fossil records

D) To analyze behaviors

**Correct Answer: B**) To determine evolutionary relationships among species

**Explanation:** Phylogenetic analysis helps scientists understand how species are related through common ancestry.