

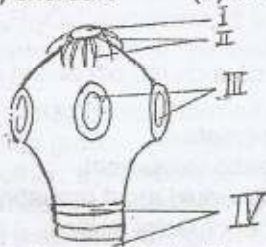
1. An amoeba moving towards a crumb of cake in a pond most likely exhibits
 - (a) phototropism
 - (b) chemotaxis
 - (c) thigmotaxis
 - (d) nastic movement
2. Which of the following cells would most probably contain the greatest number of Golgi bodies
 - (a) muscle cell
 - (b) secretory cell
 - (c) nerve cell
 - (d) white blood cell
3. A group of similar cells performing the same function is
 - (a) an enzyme
 - (b) an organ
 - (c) a tissue
 - (d) an organelle
4. Structures found in cells are listed below:
 - i) cell wall
 - ii) cell membrane
 - iii) chloroplast
 - iv) cytoplasm
 - v) nucleus
 - vi) sap vacuoleWhich of these structures are found in both animal cells and plant cells?
 - (a) i, ii and v
 - (b) i, iii and v
 - (c) ii, iii and v
 - (d) ii, iv and v
5. Which of the following is not present in the nucleus of a cell?
 - (a) chromosomes
 - (b) nucleolus
 - (c) mitochondrion
 - (d) genes
6. A plant which grows on another plant without apparent harm to the host plant is called
 - (a) a parasite
 - (b) epiphyte
 - (c) saprophyte
 - (d) a predator
7. The petals of a flower are collectively called
 - (a) calyx
 - (b) capsule
 - (c) carpel
 - (d) corolla
8. Osmosis can be defined as diffusion of
 - (a) water molecules from an area of high concentration to an area of low concentration.
 - (b) water molecules from a dilute solution to a concentrated solution across a permeable membrane

- (c) water molecules from a concentrated solution to a dilute solution through a semi-permeable membrane.
- (d) water molecules from a dilute solution to a concentrated solution through a semi-permeable membrane.



Chlorophyll

9. The oxygen given off during the process in the above equation is derived from
 (a) sunlight (b) water
 (c) carbon dioxide (d) atmosphere
10. When testing a leaf for starch, why is it first placed in boiling water?
 (a) to extract the chlorophyll
 (b) to remove colour from the leaf
 (c) to dissolve the starch
 (d) to stop chemical reactions
11. Each of the following is an arthropod except the
 (a) crab (b) scorpion
 (c) spider (d) snail
12. The largest phylum in the animal kingdom is
 (a) cnidaria (b) mollusca
 (c) chordate (d) arthropoda



13. With reference to the figure above, which of these are correct?
 a. I and II are proglottides and hooks
 b. I and III are rostellum and suckers
 c. III and IV are hooks and proglottides
 d. II and IV are hooks and rostellum
14. The two species of human tapeworm can be distinguished by the presence or absence of
 (a) scolex (b) hook
 (c) head (d) sucker
15. The ventricles of the mammalian heart are more muscular than the auricles because the
 (a) auricles have smaller capacity
 (b) ventricles are larger in size
 (c) ventricles pump blood to distant organs
 (d) ventricles receive more blood.
16. Which of the following statement is not correct about the function of each group of mammalian vertebrate?
 a. caudal vertebrae support the tail and provide attachment for tail muscles
 b. thoracic vertebrae articulate with the ribs
 c. lumbar vertebrae provide attachment for abdominal muscles
 d. sacral vertebrae support the skull and allow nodding and rotating of movement.
17. In the adult toad, gaseous exchange takes place through
 (a) Buccal, skin and spiracle
 (b) buccal cavity, bladder and lungs
 (c) buccal cavity, skin and lungs
 (d) gills, skin and buccal cavity.

18. The foot of the bird shown below is strong and has strong claws on its digits. This implies that the bird



- (a) is a scavenger
 (b) is a bird of prey
 (c) uses the foot to supplement wing action
 (d) uses the foot to scratch the soil
19. Which of the following is not a means of conservation?
 a. replacing harvested mature timber trees with their seedlings
 b. prevention of poaching
 c. controlling excessive deforestation
 d. burning of vegetation before cropping
20. One of the following statements is not true of viruses
 (a) they are micro-organisms
 (b) they are smaller than bacteria
 (c) they can be seen with an ordinary light microscope
 (d) they cause tobacco disease, polio and smallpox
21. The brain and the spinal cord constitute the
 (a) autonomic nervous system
 (b) sympathetic nervous system
 (c) somatic nervous system
 (d) central nervous system
22. Which of the following parts of the mammalian brain is involved in taking the decision to run rather than walk?
 (a) cerebellum (b) medulla oblongata
 (c) midbrain (d) cerebrum
23. Which part of the ear is responsible for the maintenance of balance?
 (a) cochlea (b) tympanic membrane
 (c) Eustachian tube (d) semi-circular canals

Answer Key

- | | | | | |
|------|-------|-------|-------|-------|
| 1. B | 6. B | 11. D | 16. D | 21. D |
| 2. B | 7. D | 12. D | 17. C | 22. D |
| 3. C | 8. D | 13. B | 18. A | 23. D |
| 4. D | 9. B | 14. B | 19. D | |
| 5. C | 10. D | 15. C | 20. C | |

Explanations to Answers

1. A directional movement in which the whole organism moves is called a TAXIS. Therefore, an amoeba will move its whole body toward a crumb cake (food) by taxis movement (B)
2. Golgi bodies – as concerned with the production of substances by this cell. Nearly all cell secretions are glycoproteins, i.e. proteins conjugated with a carbohydrate. i.e. Golgi-body will be concentrated in the environment of secretory cell (B)
3. Tissue is a group of cell that have similar structures and performing a particular function e.g. bone, blood of man (C)
4. Animal cell do not have cellulose cell wall, chloroplast and sap vacuole. The correct option is D.
5. Mitochondrion is one of the organelle in the cytoplasm and not in the nucleus (C)
6. Epiphyte grow on their host to get direct sunlight (B)
7. The collection of flower is called corolla (D)

8. Osmosis the movement of any solvent molecule through a semi-permeable membrane from a region of high concentration to a region of low concentration (D) e.g. high water concentration to low water concentration.
9. $4\text{H}_2\text{O} + \text{chlorophyll} \rightarrow 4(\text{OH}^-) + 4\text{H}^+$
 $4(\text{OH}^-) \rightarrow 2\text{H}_2\text{O} + \text{O}_2 \uparrow$
The oxygen produced during photosynthesis comes from water (B)
10. i.e. to kill and soften the tissue (D)
11. Snail is mollusca (D)
12. The arthropoda is the largest phylum in the animal kingdom. It is divided into the following classes: insect, crustacea, arachnida and myriapoda (D)
13. I – is Rostellum, II is the Hook, III is Sucker, IV is proglottis (B)
14. *Taenia solium* has rostellum and hooks while *Taenia saginata* lack rostellum and hooks (B)
15. The wall of the right ventricle are made of muscle but not quite so thick as the left ventricle (both are thicker than auricle). The right reticule contracts, forcing blood to close the tricuspid valve so that blood can only leave the ventricle by other opening into the pulmonary artery (C).
16. Sacral is not at the head region, it is located at the inner abdomen (C)
17. Adult toad do not have gills, the gaseous exchange is through the skin, lung and buccal cavity (mouth) (D)
18. This is for scavenger (e.g. vulture) (A)
19. Burning of vegetation before cropping will kill the microorganism and change the ecosystem (D)
20. Viruses can not be seen with ordinary light microscope, electron microscope have to be employed (C)
21. Brain & spinal cord make up central nervous system(D)
22. Cerebrum controls all voluntary actions like learning, intelligence, thinking, imagination and memory which are aspect of intelligent behaviour (D).
23. The inner ear, which is fluid filled has a complicated structure. It has an upper end with the three semi-circular canal at right angles to one another, Impulse from the semi-circular help the brain to analyse complex body movement & bring about the necessary response to maintain balance (D).

OBAFEMI AWOLOWO UNIVERSITY
2007 POST UME TEST

1. Where is the energy produced in a cell?
 (a) nucleus (b) lysosomes
 (c) mitochondria (d) nucleolus
2. Which of the following organisms does not exist as a single free-living cell?
 (a) amoeba (b) euglena
 (c) clamydomonas (d) volvox
3. Euglena is an autotrophic organism because it
 (a) has flagella (b) has plant and animal features
 (c) can manufacture its food (d) moves fast
4. In which of the following organisms does a single cell perform all functions of active movement, nutrition, growth, excretion and photosynthesis?
 (a) paramecium (b) amoeba
 (c) euglena (d) hydra
5. What is the function of contractile vacuole in paramecium?
 (a) produces enzymes (b) gets rid of excreta
 (c) stores and digests food (d) gets rid of excess water
6. The ability of organism to maintain a constant internal environment is known as
 (a) diuresis (b) endosmosis
 (c) plasmolysis (d) homeostasis
7. Which of the following is the medium of transportation of nutrients within unicellular organism?
 (a) lymph (b) plasma
 (c) protoplasm (d) serum
8. In aerobic respiration, oxidative phosphorylation takes place in
 (a) cytoplasm (b) lysosome
 (c) mitochondrion (d) ribosome
9. Bryophytes are different from flowering plants because they
 (a) are simple small plants
 (b) carry out alternation of generation
 (c) posses small (d) posses no vascular tissue
10. In lower plants like mosses, the structure which performs the functions of roots of higher plants is called
 (a) roots hairs (b) rhizoids
 (c) hyphae (d) roots
11. Which of the following components of an ecosystem has the greatest biomass?
 (a) primary producers (b) primary consumers
 (c) secondary consumers (d) tertiary consumers
12. The young shoot of a plant is referred to as
 (a) radicle (b) plumule (c) bud (d) branch
13. The name of a bacterium which derives its energy form oxidizing nitrites into nitrates is
 (a) Nitrosomonas (b) azotbacter
 (c) nitrobacter (d) Escherichia coli
14. Potometer is used to measure
 (a) rate of osmosis (b) rate of diffusion
 (c) rate of transpiration (d) rate of photosynthesis
15. Meiotic cell division ensures that
 a. many similar cells are produced
 b. chromosome number of cells is halved
 c. cells produced are doubled
 d. cells produced posses the same chromosome number
16. The stem of young herbaceous plants are kept upright mainly by
 (a) osmotic pressure (b) turgidity
 (c) transpiration pull (d) root pressure
17. Which of the following tissues is not found in the stem and root of monocotyledons?
 (a) xylem (b) cambium (c) pith (d) pericycle
18. Fruit enlargement can be induced by spraying young ovary with
 a. gibberellins, ethylene and abssisic acid
 b. Auxins, abscisic acid and ethylene
 c. Auxins, cytokinin and gibberellins
 d. Auxins, kinin and gibberellins
19. A dry indehiscent, winged fruit formed form one carpel is known as
 (a) schizocarp (b) caryopsis
 (c) samara (d) nut
20. A fruit which developes without fertilization is described as
 (a) simple (b) aggregate
 (c) multiple (d) parthenocarpic
21. A dwarf plant can be stimulated to grow to normal height by the application of
 (a) thyroxin (b) gibberellins
 (c) insulin (d) kinin
22. The condition known as cretinism is caused by the deficiency of
 (a) vitamin A (b) insulin
 (c) thyroxin (d) vitamin C
23. The difference between viviparous and oviparous animal is
 (a) possession of yolked eggs
 (b) laying and brooding of eggs
 (c) possession of yolkless egg
 (d) laying of unfertilized egg
24. The following are features of the tropical rainforest except
 (a) loose and moist soil
 (b) short trees growing beneath tall trees
 (c) scanty trees with small leaves
 (d) presence of many animals

Answer Key

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|------|-------|-------|-------|-------|
| 1. C | 6. D | 11. B | 16. B | 21. B |
| 2. D | 7. C | 12. B | 17. B | 22. C |
| 3. C | 8. C | 13. C | 18. C | 23. B |
| 4. C | 9. D | 14. C | 19. C | 24. C |
| 5. D | 10. B | 15. B | 20. D | |

Explanations to Answers

1. The nucleus contains the nucleolus and it is responsible for reproduction i.e. it contains the information for genetic make up. Mitochondria is usually referred to as the power house because they contain enzymes that carry out the oxidation of food substance and they synthesis ATP (adenosine triphosphate), the energy of the cell (C).
2. Some organisms are made of many similar cells which are joined or massed together and they can not be differentiated form each other. Example of such organisms which exist as colonies are VOLVOX (D).
3. The word antho means "Self". Anthotrophic is the mode of nutrition for organisms that manufacture their own food and euglena has chloroplast which makes it possible for euglena to manufacture its own food (C).

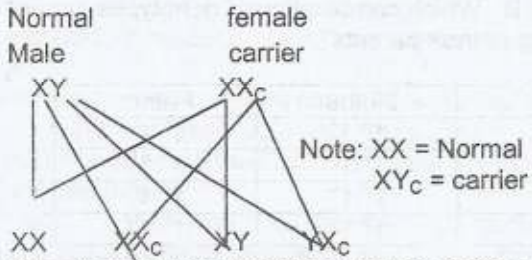
4. Euglena is the only organism in the option that has chloroplast for photosynthesis (C).
5. Contractive vacuole in paramecium is for osmoregulation i.e to get rid of excess water (d)
6. Homeostasis is defined as the maintenance of a steady state in living organisms by control of the internal environment (D).
7. The living material of the cell consists of the nucleus and cytoplasm called protoplasm. Unicellular organism exchange materials through the protoplasm (C).
8. Phosphorylation of hexose sugar is a necessary first step in the oxidative breakdown of sugar in respiration and the process of expending energy takes place in the mitochondria (C).
9. Bryophytes are complex, multicellular green plant that lack vascular tissue (D).
10. Rhizoids are the false roots in mosses, it grows into the soil from the base of the stem. (D).
11. Biomass takes into account both the size of the individual organism and their numbers. The number of the species decreases and size increases as we move upward in the tropic level. The primary consumer has the highest biomass in food chain (B).
12. Plumule is the young shoot in a plant (B) while radical is the young root.(B)
13. Nitrosomonas convert ammonia to nitrites while nitrobacter convert the nitrite to nitrates (C).
14. The rate of transpiration is monitored using photometer (C).
15. During meiosis, the chromosome number in gametes becomes half (haploid) of the original mother cell (diploid) (B)
16. Transpiration pull involve the force which maintain the transpiration streams, these forces are strong. Root pressure is responsible for the conduction of water through the root. Turgid parenchyma makes the cell. Strong and rigid, so they give mechanical support (B)
17. Cambium, a meristemic tissue which gives rise to secondary growth appear in dicotyledon root and stem but is completely absent in monocotyledons (B).
18. Auxins promotes cell elongation and stimulate cell division likewise Gibberellin also promote cell division, hormone abscisic acid can make stomata close and falling off of fruits and leaf withering. Ethylene dramatically increase the respiration rate which leads to the ripening of fruit, cytokinins is found where rapid cell division is occurring (C).
19. Samara is a simple tree fruit in which the pericarp is extended to form one or more wing like structures. It develops from a superior ovary made-up of more than one carpel (C).
20. Occasionally, fruit formation occurs in the absence of fertilization known as parthenocarpy, can be induced by treating unpollinated flowers with IAA (D).
21. Hormone Gibberellins stimulate cell division (B).
22. Thyroxine is responsible for controlling the basal metabolic rate and its therefore particularly important in growth. Under secretion of it during development (hypothyroidism) causes arrested physical & mental development, a condition called cretinism (C).
23. **Oviparity** is when the fertilized egg can be enclosed within a protective covering before it leaves the females body as in many invertebrates. **Viviparity** is when the embryo is protected and nourished within the uterus, with the placental of mammals (B).

24. The tropical rainforest vegetables is dominated by tall trees with their widespread canopies. The plant community falls into five layers and can be identified with three top layer of trees. The soil is moist and loose rich in humus. Scanty trees with small leaves in a feature of savannah vegetation (C).

**OBAFEMI AWOLowo UNIVERSITY, ILE IFE
2008 POST UME TEST**

1. One of the functions of xylem is
 - (a) strengthening the stem
 - (b) manufacturing food
 - (c) conducting manufactured food
 - (d) none of the above.
2. People suffering from myopia
 - (a) can see near objects clearly
 - (b) can see far away objects clearly
 - (c) cannot see any object clearly
 - (d) are colour-blind
3. The cilia in paramecium are used for
 - (a) respiration
 - (b) locomotion
 - (c) protection
 - (d) excretion
4. Which of these types of skeleton is most appropriate to the cockroach?
 - (a) hydrostatic skeleton
 - (b) exoskeleton
 - (c) endoskeleton
 - (d) cartilaginous skeleton
5. When proteins are broken down they provide
 - (a) oxygen
 - (b) carbohydrate
 - (c) energy
 - (d) amino acids
6. The function of lenticel is
 - (a) to receive excess water in the plant
 - (b) to absorb water from the atmosphere
 - (c) for gaseous exchange
 - (d) to absorb light
7. Which of the following is characteristic of the animal cell
 - (a) presence of chloroplasts
 - (b) possession of a cellulose cell wall
 - (c) absence of large vacuoles
 - (d) presence of large vacuoles
8. In the life history of *Schistosoma* (Bilharzia), of the following is the intermediate host
 - (a) man
 - (b) snail
 - (c) mosquito larva
 - (d) fish
9. The hormone which tones up the muscles of a person in the time of danger is from the
 - (a) thyroid gland
 - (b) pancreas
 - (c) adrenal gland
 - (d) spleen
10. The study of the organisms and the environment of an abandoned farmland is the ecology of
 - (a) a community
 - (b) a population
 - (c) a species
 - (d) an ecosystem
11. At fertilization
 - a. one chromosome from the male joins another from the female
 - b. one gene cell from the male combines with the other from the female
 - c. the male nucleus fuses with the female nucleus
 - d. one set of male chromosome combines with another set from the female
12. The neck region of the tapeworm (*Taenia spp.*) is responsible for the
 - (a) production of eggs
 - (b) the storage of eggs
 - (c) the formation of new segments
 - (d) the development of the suckers.
13. The movement of molecules from a region of higher concentration to one of lower concentration is

24. Protein → peptone(d) → polypeptide (a) → amino acid(c) (D).
25. The walls of the stomach are muscular and regular peristaltic movements churn up the food, mixing it thoroughly with the gastric juice. By the time it is ready to leave the stomach, the food looks like a watery paste, called CHYME (A).
26. (A)
27. Hemophilia is an abnormality controlled by a recessive gene located on the X-chromosome.



Since it is the female genes that are carrier, the percentage of the carrier is 25% (B)

2009 POST UME TEST

- One of these is not found in the urine
 - water
 - sodium chloride
 - nitrogenous compounds
 - calcium chloride
 - nitrogenous salts.
- An organism with a pair of indistinguishable genes is a
 - heterozygote
 - hybrid
 - allelomorph
 - homozygote
 - diploid
- The fruit formed from a single flower having several free carpels is called
 - multiple fruit
 - Simple fruit
 - aggregate fruit
 - dehinscent fruit
 - indehiscent fruit.
- The function of ossicles (maleus, incus and stapes) in the mammalian ear to
 - transmit vibrations
 - regulate pressure
 - support of the inner ear
 - maintain balance during motion
 - secrete oil
- "Joined skeleton" is absent in the
 - cockroach
 - spider
 - millipede
 - snail
 - house fly
- Mucor and spirogyra can be put in a group because they
 - Are unicellular
 - Have spores that are dispersed by wind
 - Can live independent lives
 - Reproduce sexually
 - Have bodies made up of thallus and filaments alternatively.
- The organ through which nourishment and oxygen diffuse into an embryo is called
 - Amnion
 - chorion
 - umbilical cord
 - oviduct
 - placenta
- A tapeworm fasten itself to the intestine of its host with
 - Neck & sucker
 - hooks & suckers
 - proglottis & neck
 - rostellum hooks & suckers
- Which of these is false about the piliferous layer of a root? It
 - Has a thin cuticle
 - Is the outermost layer of the corex
 - May bear root hairs
 - Breaks down with age
 - Is replaced by cork in old roots.
- Anaerobic respiration in yeast produces
 - CO₂ & ethanol
 - CO₂ & H₂O
 - CO₂ & O₂
 - CO₂ & glucose
 - Ethanol & H₂O
- Which one of these set of factors is completely abiotic?
 - Turbidity, tide salinity, plankton
 - pressure, pH, soil insect
 - Water, soil, bacteria, salinity
 - pH, bamboos, wind, rainfall
 - Light, altitude, wind, humidity
- In which of these are flagella and cilia found?
 - Flatworms
 - Protozoa

(c) Coelenterates (d) Annelids (e) Nematodes

13. The three important organs that are situated close to the stomach are

- (a) Liver, kidney & gall bladder
- (b) pancreas, liver & kidney
- (c) Gall bladder, pancreas & spleen
- (d) liver, kidney & spleen (e) kidney, gall bladder, liver

14. The plantain reproduces asexually by

- (a) Spores (b) Buds (c) Fragments
- (d) Suckers (e) Flowers

15. The major function of swim-bladder in fish is

- (a) Breathing (b) Swimming (c) Diving
- (d) Repelling enemy (e) Buoyancy

16. The part of the central nervous system concerned with answering an examination question is the

- (a) Spinal Cord (b) Cerebellum (c) Oryx
- (d) cerebrum (e) Medulla oblongata

17. Wind pollinated flowers usually have

- (a) long styles (b) sticky stigmas
- (c) small and short stigmas (d) rough pollen grains
- (e) small styles and pollen.

18. The radicle of a bean seedling grows most rapidly in the region

- (a) of the root tip (b) below the top soil
- (c) just around the root tip (d) just below the root tip
- (e) just above the root tip.

19. A key similarity between nervous and hormonal system is that both

- a) Involve chemical transmission
- b) Have widespread effects
- c) Shed chemicals into the blood stream
- d) Evoke rapid response (e) Eliminate response

20. The bone of the neck on which the skull rests is

- (a) Odontoid (b) Axis (c) Occipital
- (d) Atlas (e) patella

21. A child blood group genotype different from those of both parents and with a mother of genotype OO, can only have a father of genotype

- (a) A (b) B (c) OO (d) AB (e) AA

22. A true climax community

- a) changes from year to year
- b) persists until the environment changes
- c) Is the first stage in plant succession
- d) Consists of tallest trees and small animals
- e) Is in a state of perturbation.

23. In a predator food chain involving secondary and tertiary consumers, the organisms become progressively

- (a) smaller (b) equal in number
- (c) large and fewer along the food chain
- (d) parasitized along the food chain as consumers get bigger (e) sparse in distribution.

24. Which one of these is an adaptation to a xerophyte environment?

- a) fleshy tissue with reduced leaves
- b) extensive surface roots and broad leaves
- c) thick barks and broad leaves
- d) rough leaves and shallow root system
- e) stunted growth and surface roots.

25. When it is cold, the blood vessels of the skin

- a) dilate to increase blood flow to the skin
- b) constrict to reduce the amount of blood flowing to the skin
- c) dilate to reduce the amount of blood flowing to the skin
- d) constrict to increase the amount of blood flowing to the skin

ANSWER KEY

- | | | | | |
|------|-------|-------|-------|-------|
| 6. D | 6. B | 11. E | 16. D | 21. D |
| 7. D | 7. E | 12. B | 17. A | 22. B |
| 8. C | 8. B | 13. C | 18. A | 23. C |
| 9. A | 9. A | 14. D | 19. D | 24. A |
| 5. D | 10. A | 15. E | 20. D | 25. B |

Explanations to Answers

1. Calcium chloride is not found in urine. Urine contains sodium chloride, urea, water in addition to other compounds (D).
2. An individual is said to be homozygous if it has two similar genes for the same character i.e. it has two identical alleles at the same position on a pair of chromosomes e.g. TT is for tallness (D).
3. Aggregate fruits are produced from a single flower with an apocarpous pistil i.e. several free carpels and hence a collection of simple fruit e.g. cola-fruit and rose fruit (C)
4. Three tiny bones called ossicles, fit against one another to form a chain of bones stretching from the inside of the eardrum across the middle ear. Sound vibration travel down the outer ear and vibrate the eardrum. This causes vibration of fluid in the inner ear, so that the sensors cells in the cochlea receive the stimulus (A)
5. Snail do not have joined skeleton, its soft body muscle is enclosed or housed in a shell(D)
6. They can for spores which can be blown by wind (B)
7. The embryo develops an organ called the placenta. The placenta is firmly attached to the wall of the uterus and through it nourishment and Oxygen are obtained by the embryo from the mother and waste products are removed (E)
8. On top of the scolex is a projection called the rostellum, which has hooks and four evenly spaced sucker on the outside. The tapeworm fasten itself to the intestine using hooks & sucker (B)
9. The outermost layer of the cortex is called piliferous layer. Unlike the epidermis of the stem, the piliferous layer has no cuticle (A).
10. Anaerobic respiration is the breaking down of complex molecules in the absence of Oxygen to give carbon dioxide and Ethanol(A)
11. Abiotic factors in ecology study are those that do not involve living things e.g temperature, Rainfall, Relative humidity, light, pressure soil acidity, topography are commonly called Edaphic factors(E)
12. Flagella and cilia are locomotive organs i.e. for movement, paramecium use cilia while eugelena use flagella, it is common to protozoa (B).
- 13 Gall bladder, pancreas & spleen are available in the stomach
14. Sucker is the root part of plantain & it is also used for vegetative propagation (D)
15. Swim bladder is used for buoyancy in fish (E)
16. The cerebrum controls all voluntary action like learning intelligence, thinking, imagination and memory which are aspect of intelligent behavior (D)
- 17 In wind pollinated flower, the stigmas hang outside the flower borne on long flexible styles (A).

18. Apical meristems are responsible for the increase in length of roots and stem, are found at the tip of stem and root (A).
19. Nervous and hormonal system are both reflex action, it is rapid and automatic response to stimulus without the involvement of the brain (D).
20. The skull rest on the atlas bone of the cervical vertebra (D).
21. Since mother blood group – O (I^0I^0) the child can only have a father with blood group AB, to have a blood group different from both parents i.e. either blood group A or B (D)
22. A climax community do not change form time to time, it persists until the environment change (B).
23. As we move upward in the food chain, the size of the organism increased and become fewer in number (C)
24. Xerophyte are plant adapted with desert habitat. They have fleshy tissue and reduced leaves to reduce transpiration and (water lose) and extensive roots for water. Hydrophytes are aquatic plants with broad leaves, to tap enough sunlight, for photosynthesis i.e. increase in rate of water loss and short roots since water is in abundance (A).
25. In cold, the blood vessel in the skin will get smaller (or constrict) so that very little blood will reach the skin surface, this reduces heat loss by radiation (B).

1. Which of the following is the basic unit of classification of plants and animals?

- (a) genus
- (b) species
- (c) phylum
- (d) kingdom.

2. Alternation of sexual and asexual method of reproduction is found in

- (a) euglena
- (b) ferns
- (c) blue green algae
- (d) grasses

3. _____ is not a non-seed plant

- (a) cycad
- (b) conifer
- (c) fern
- (d) none of the above

4. Which type of association is shown by a fern growing on the stem of oil palm?

- (a) epiphytism (b) Saprophytism
(c) commensalism (d) symbiosis
5. Which of the following is likely to encourage inbreeding in plants?
(a) Diecious (b) predation
(c) Monoecious (d) hermaphrodite
6. The biological association that contributes directly to succession in a community is
(a) competition (b) predation
(c) parasitism (d) commensalism
7. Grasses recover quickly from bush fires in the savanna because of their _____
(a) fibrous roots (b) succulent stems
(c) perennating organs (d) rapid growth rate
8. The ability of an organism to live successfully in an environment is known as _____
(a) resistance (b) competition
(c) succession (d) adaptation
9. The community of plants in which the same species occur from year to year is the _____
a) perennial species (b) climax species
(c) pioneer vegetation (d) annual species
10. _____ is an autotrophic mode of nutrition
(a) chemosynthesis (b) saprophytism
(c) parasitism (d) symbiosis
11. Which of the following is not an organ?
(a) leaf (b) kidney
(c) heart (d) bone
12. Mendel's first law is known as the law of
(a) use and disuse (b) segregation of genes
(c) evolution (d) independent assortment of genes.
13. An interlocking form pattern of feeding relationship is called
(a) food chain (b) nutrition
(c) consumer (d) food web
14. The group of animals described as glorified reptiles is
(a) Pisces (b) amphibian
(c) Aves (d) Mammals
15. The anal and dorsal fins of fish are used for
(a) steering (b) buoyancy
(c) upward movement (d) controlling rolling movement
(e) downward movement
16. The significance of mitosis includes all of the following except
(a) genetic stability (b) growth
(c) cell replacement (d) degeneration
17. Which of the following is absent in the prophase stage of meiosis?
(a) leptotem (b) zygotem
(c) pachytem (d) triptonema
18. The photosynthetic pigments include
(a) chlorophyll and carotenoids
(b) chloroplasts and cytochromes
(c) melanin and haemoglobin
(d) carotenoids and haemoglobin
19. Which of the following produces both hormones and enzymes?
(a) pancreas (b) ileum (c) gall bladder (d) kidney
20. Of the following, which one lacks chaetae, tentacles and antennae?
(a) snail (b) earthworm
(c) millipede (d) snake
21. Etiolation is caused by the influence of
(a) CO₂ (b) water
(c) mineral salt (d) HCl (e) light

22. Epigeal animation can be found in
(a) sorghum (b) maize
(c) millet (d) groundnut
23. _____ is not sex-linked.
(a) Stunted growth (b) river blindness
(c) haemophilia (d) colour blindness
24. The pyrenoid in spirogyra
(a) usually contains starch
(b) is suspended cytoplasmic strands
(c) is mainly used for respiration
(d) excrete waste product
25. Flower is to the angiosperm as _____ is to gymnosperm
(a) pines (b) cords (c) cone (d) anther

Answer Key

1. B 6. A 11. D 16. D 21. E
2. B 7. A 12. B 17. 22. D
3. B 8. D 13. D 18. A 23. A/B
4. C 9. B 14. C 19. A 24. A
5. C 10. A 15. D 20. D 25. C

Explanations to Answers

1. The species is the smallest unit of classification (B)
2. The prothallus of a fern is equivalent to the gametophyte generation of a moss because it bears the sexual organs, while the fern plant is equivalent to the sporophyte or spore bearing generation, so we can say plant like fern and mosses show alternation of generations. That is, in their life cycle a sexual (sporophyte) generation and sexual (gametophyte) generation alternate (B).
3. Conifer belongs to the gymnosperms family. These are plants with naked seeds, they do not bear flowers. The seeds are borne on special structures called **Cones** (B)
4. Fern and oil-palm commensalism. The epiphyte (fern) get enough sunlight to carry out photosynthesis by climbing on the palm oil tree. In commensalism association, one partner benefits while the other, the host is unaffected (C).
5. Plants in which both pistillate and staminate flowers are borne on the same plant are called Monoecious. Diecious is when pistillate and staminate are on separate plants. Monoecious encourage inbreeding (C)
6. Competition involves the interactions among two organisms of the same species or different species in which one outgrows or survives (A)
7. This is because of their fibrous roots which germinate rapidly and are fire resistant (A)
8. Living organisms are found in different types of habitats. These organisms show features that enable them to live successfully in these environments. These may be functional, behavioural or structural. Such features are called adaptation (D).
9. This is the final community or what ecologists call the Climax of the succession (B)
10. Chemosynthesis is the synthesis of organic compounds from CO₂ and H₂O but the energy instead

- of coming from light is supplied by special method of respiration involving the oxidation of various inorganic materials such as hydrogen sulphide ammonia. Chemosynthesis is used by certain bacteria (A).
11. Bone is not an organ but a tissue (D)
 12. Mendelian's first law of segregation states that contracting factors (i.e. genes are present in pairs in non-reproductive or somatic cells so that when an organism forms a gamete the pair separate (B)
 13. Numerous food chains are present in an ecosystem and these are linked together in a food web (D).
 14. (C)
 15. Pectoral and pelvic fins are moved independently and are used for steering and balancing and also for back and forward movement. (D)
 16. Mitosis takes place when cells divide during growth, development and also during asexual reproduction. Mitosis enhance regeneration & stability. It does not encourage degeneration. (D)
 17. -
 18. Haemoglobin is red pigment in the blood, Melanins are for skin colouration, cytochromes are not pigments involved in photosynthesis. The chloroplasts contain a mixture of several pigments, the main one being chlorophylls, caretenoids and xanthophyll (A)
 19. Pancreas produced insulin for sugar regulation and produce enzymes like pancreatic amylase, lipsin and pancreatic lipase (A).
 20. Snake do not possess all the mentioned features (D)
 21. Light is required for photosynthesis and chlorophyll without which photosynthesis can not take place. A seedling grown in the dark becomes etiolated. It is yellow, due to lack of chlorophyll. Therefore, the deficiency in green pigment owing to lack of light (E).
 22. Epigeal germination is defined as the type of germination in which the cotyledons or seed leaves are carried above the soil surface. It is associate with dicotyledons like groundnut, cowpea and melon (D).
 23. River blindness is caused by roundworm and other filarial worms. Stunted growth is not sex linked character, it is caused by malnutrition (A &B)
 24. Starch grains normally accumulate around the pyrenoids when exposed to light (A).
 25. C

OBAFEMI - AWOLowo UNIVERSITY, ILE IFE
2011 POST UTME TEST

1. Which of these groups of animal rivals mammals in the display of parental care features?
 A. birds B. Reptiles
 C. Pisces D. None of the above.
2. An assemblage of populations of different species which interact through trophic & spatial relationship is best described as a on

- A. city B. community
C. ecosystem D. niche.
- In which biome would you expect to have the shortest growing season?
A. tropical rain forest B. guinea savanna
C. Sudan savanna D. deserts.
 - Which of the following is an incorrect statement about savanna?
A. it occupies about 80% of the land surface of Nigeria
B. it has no woody species.
C. it is usually burnt annually,
D. it is a closed or nearly closed cover of grasses.
 - Which of the following habitats cannot be used for the study of succession?
A. abandoned farmland B. pond
C. savanna grassland D. well cultivated farmland.
 - In which of these associations is much harm done to one of the partners?
A. symbiosis B. commensalism
C. parasitism D. mutualism
 - Effect of air pollutant does not include:
A. formation of carboxyl haemoglobin
B. displacement of digested food
C. lowering plant yield
D. damage breathing organs.
 - A typical feature of a plant cell is the presence of.....
A. chromosome in nucleus B. cellulose cell wall.
C. mitochondria. D. membrane around the nucleus
 - Non seed plants are found in
A. desert and arctic regions only.
B. all environments
C. cold mountain areas and hot springs.
D. tropical and subtropical regions only
 - Which of the following phyla has been found to be the most successful in the animal kingdom?
A. phylum Annelida. B. phylum Arthropoda
C. phylum chordata D. phylum mollusca.
 - In the tropical rainforest, there is little or no litter on the forest floor because of high
A. rainfall B. temperature
C. light intensity D rate of decomposition
 - Adaptive features of plants to desert conditions include
A. thick barks, succulent stems and sunken stomata
B. thin barks, succulent stems and sunken stomata.
C. think barks, air floats on stems and sunken stomata D. air spaces on issues, adventitious roots and thin barks.
 - The distribution of plants in rainforest is governed mainly by
A. vegetation B. soil types
C. amount of rainfall D. rainfall pattern.
 - The greatest influence on a stable ecosystem in nature is
A. man B. pollution C. animal D. rainfall.
 - Which of the following is the basic unit of classification?

- A. genus. B. species. C. phylum D. kingdom
- Which two structures are present in a palisade cell but not in a liver? A. cell wall and cytoplasm
B. cell wall and chloroplast C. cell membrane and cytoplasm. D. cell membrane and chloroplast.
 - Workers in deep mines usually suffer from dehydration because.
A. water is lost due to evaporation
B. water is lost due to defecation
C. water is lost in the form of sweat
D. water is lost along with salts in the form of sweat.
 - Glucose is reabsorbed in the kidney mainly by
A. Bowman's capsule
B. proximal convoluted tubule
C. distal convoluted tubule D. loop of henle.
 - The most common substrate of respiration is
A. fats B. amino acids C. glucose
D. sucrose
 - The rate of heart beat in an adult human being is
A. 71 beats per minute B. 72 beats per minute
C. 73 beats per minute D. 74 beats per minute.
 - One of the following is not true
A. saprophytic nutrition involves feeding on soluble organic material from inorganic substances.
B. symbiosis is a nutritional relationship in which both organisms involved derive benefit
C. A parasite causes injuries to its host in the course of getting its food
D. holozoic mode of nutrition can be seen in animals, carnivorous plants and some protists.
 -is responsible for the direction of growth and development of the organism.
A. the nucleus B. the DNA
C. the neuron D. the RNA.
 - The chromosome number in man is
A. 46 B. 23 C. 92 D. 58.
 - Effectors are
A. muscles which work in response to the stimulus received from the motor nerves.
B. glands which work in response to the stimulus received from the motor nerves.
C. muscles or glands which work in response to the stimulus received from the motor nerves.
D. efferent neurons.
 - The following are formed in the bone marrow except
A. platelets B. Basophils
C. granulocytes D. lymphocytes.

Answer Key

- | | | | | |
|------|-------|-------|-------|-------|
| 1. A | 6. C | 11. D | 16 B | 21. B |
| 2. B | 7. B | 12. A | 17. D | 22. A |
| 3. D | 8. B | 13. C | 18. B | 23. A |
| 4. B | 9. B | 14. A | 19. C | 24. C |
| 5. D | 10. B | 15. B | 20. A | 25. A |

Explanations to Answers

1. Birds are the only animals that rival mammals among the mentioned animals because birds still provide shelter, guard & food for their young ones after birth compared with that of mammals (A).
2. Ecosystem is the study of organisms in relation to their environment. A community is made up of either plant or animals living in a habitat, in the soil there is a community of organisms which includes earthworms, termites, & other insects. (B)
3. The geographical regions, cutting across different continent, are lumped together as BIOMES. The shortest growing season exist in the DESERT, just because the rainfall is very scanty & generally below 250mm annually (D).
4. In tropical Africa, we have Guinea Savanna & Sahel savanna and southern guinea savanna. The southern guinea savanna have moderate rainfall, the vegetation is woodland type with tall grasses up to 3m high (B).
5. Succession refers to the series of gradual changes being carried out by plant & animal communities in an area, in which with time, lower organisms are replaced by higher ones. Therefore, a well cultivated farmland cannot be used to determine the changes because most primary succession would have been destroyed (D).
6. In symbiosis, each members benefit from the association, it is a mutual benefit. In commensalism, one member benefits while the other, the host is unaffected. In parasitism, the parasite lives on another, the host, deriving benefit from it & causing harm to it (C).
7. Carbon (II) oxide (poisonous) gas form carboxyl Haemoglobin, poisonous gas like sulphur (IV) oxide, heavy metals can cause tracheal disease. Some air pollutant like heavy metals, acidic particles can reduce the soil fertility. Air pollutant is not likely to have direct link with digestive system (B).
8. Plant cell is made of cellulose cell wall which is responsible for the strengthening of the cell wall (B).
9. Seedless plants can be found in any environment or region. (B)
10. The arthropods mark the origin of the body plan characteristic of the most successful of all animal groups. This innovation was the development of jointed appendages (B).
11. The rain forest are near the equator and as such characterized by plenty of sunshine and heavy annual rainfall. This increases the rate of decomposition of the forest litter (D).
12. Desert plants (xerophytes) adapts to the desert habitat by reducing the rate of photosynthesis, loss of water (transpiration). This is achieved with thick barks (for loss of water), succulent stems & sunken stomata (A).
13. The distribution of plant in Rainforest is governed mainly be the amount of rainfall (C)
14. Man has a great influence on the ecosystem, because man engaged in many activities that affect ecosystem (A).
15. Classification is the arrangement of organisms into a series of groups based on physiological, biochemical, anatomical or other relationships. The smallest group commonly used is the species. Species are grouped into genera (genus), tribes, families, orders, classes and phyla (phylum) to kingdom (B).
16. Palisade cells are a dense green colour due to the numerous chloroplast they contain. These cells are packed tightly together in a regular arrangement near the upper surface of the leaf. (B).
17. Deep miners usually work far below earth surfaces. They lose water in the form of sweat because of the heat below the earth surface (C).
18. Glucose, amino acids & large amounts of inorganic ions are re-absorbed at the proximal convoluted end of the glomerulus filtrate (B).
19. Respiration is the breaking down of large molecules (mostly glucose) to produce carbon IV oxide, water & energy. The main source of energy in organism is carbohydrates (C).
20. In adult human, typical values for a sedantary male at rest are a stroke volume of 75 cm³ and a heart rate of 71 per minute (A)
21. Symbiosis is not a nutritional relationship but an association between species which is not always based on nutrition (B)
22. Growth & development involve not only an increase in size but also a progressive addition of visible complexity as cell differentiation proceeds in the embryo. If a fertilized egg is deprived of nucleus it fail to develop properly (A).
23. The somatic cell (body cell) in man is made up of 23-pairs of chromosome i.e. 46-chromosomes (A).
24. An effector is a structure which responds, directly or indirectly to a stimulus. Most effectors are controlled by nervous system & respond when they receive impulse from efferent nerves. They may be gland that secretes particular substances as a result of stimulation (C)
25. Platelets are fragments of cells broken off from large cells in the bone marrow, they are also known as thrombocytes. Basophils, lymphocytes, neutrophils, eosinophils and monocytes are fine distinct types of leucocytes (white blood cell) and leucocytes are produced from the bone marrow. White blood cell can be into two main groups: Granulocytes and agranulocytes (A)

1. Sister chromatid are:
 - (A) Two identical copies of a single chromosome produced during s-phase
 - (B) Pairs of chromosomes
 - (C) Points of attachments of centromeres to the chromosomes
 - (D) Chromosomes found in cells of sisters
2. One of the groups of organisms below is critical in the entire process of nutrient cycling
 - (A) Aves (B) Nematoda (C) Mammalia (D) Fungi
3. Hierarchical organism is in one of the following orders:
 - (A) Atoms, molecules, compound, cells, tissues, organs, systems organism
 - (B) Atoms, molecules, organelles, cells, tissues, organs, systems organism
 - (C) Atoms, elements, molecules, cells, tissues, organs, systems, organism
 - (D) Atoms, molecules, elements, cells, tissues, organs, organ system, organism
4. In a monohybrid cross between round seed and wrinkled, what is the number of wrinkled seed that would be formed at F_2 if the total is number is 7324?
 - (A) 456 (B)786. (C) 686. (D) 860
5. Steepness of slope generally affect
 - (A) Rainfall (B) Drainage
 - (C) Sunlight (D)All of the options
6. Bacterial differ from eukaryotic forms of life in that they:
 - (A) are causes of all infectious diseases
 - (B) have no nuclear membrane
 - (C) reproduce by binary fission
 - (D) have a thick cell-wall
7. Which of the following statements is NOT correct?
 - (A) are causes by blood and lymph
 - (B) have their effect on target organs
 - (C) complement nervous co-ordination
 - (D) are not produce in specific glands.
8. If 80 grasshoppers are found in a field with a total area of $100m^2$ what is the population density of grasshopper in the field?
 - (A) $0.08 \text{ per } m^2$ (B) $0.8 \text{ per } m^2$
 - (C) $80 \text{ per } m^2$ (D) $100 \text{ per } m^2$
9. Which of the following is part of the axial skeleton in a mammal?
 - (A) Phalange (B) Tarsal
 - (C) Sacrum (D) Patella
10. One of the following organism exhibits a closed and single circulatory system
 - (A) Insect (B) Earthworm
 - (C) Fishes (D) Mammals
11. Coelomates are animals with
 - (A) no body cavity (B) true body cavity
 - (C) false body cavity (D)two germ layer
12. This tissue is made up of tracheids, vessels, fibres and parenchyma. What is it?
 - (A) Phloem (B) sclerenchyma
 - (C) xylem (D) ground tissue
13. The important processes which bring about recycling of carbon dioxide between the biotic and abiotic components of an ecosystem are all of the following except
 - (A) Photosynthesis (B) respiration
 - (C) decay (D) burning of fossil fuels
14. When a cut is made on the trunks of certain trees, the milky fluid exuded is called
 - (A) rubber (B) resin (C) alkaloid (D) latex
15. The system of membrane-lined sacs that form channels through - out the cytoplasm and whose membrane is continuous with the nuclear membrane is the
 - (A) Mitochondrion (B) Ribosomes
 - (C) Endoplasmic reticulum (D) Golgi apparatus
16. The type of farming which involves raising livestock only is called
 - (A) Mixed farming (B)Subsistence farming
 - (C) Pastoral farming (D) monoculture
17. Fruits that develop without fertilization and are seedless are known as
 - (A) Parthenocarpic fruits (B)Aggregate fruits
 - (C) simple fruits (D) Epicarpic fruits
18. A major difference between Arachnids and Annelids is that
 - (A) In Annelids, body consists of dissimilar segments unlike in Arachnids
 - (B) In Annelids, body consists of similar segments unlike in Annelids
 - (C) In Arachnids, the cephalothorax is not distinct unlike in Annelids
 - (D) In Annelids, the cephalothorax is distinct unlike in arachnids
19. The process in which the internal environment of an organism is maintained is called
 - (A) Co-ordination (B) Homeostasis
 - (C) Excretion (D) Metabolism
20. Which of the following is the hardest material in the body of animals?
 - (A) Cartilage (B) Bone (C) Enamel (D) Dentine
21. One of these statements is true of caryopsis
 - (A) Pericarp and seed coat are fused
 - (B) Pericarp is free from seed coat
 - (C) Pericarp splits open
 - (D) Pericarp with a superior ovary
22. A biological species must possess the following characteristics except
 - (A) Live only in one place (B) Must interbreed
 - (C) Must produce fertile offspring
 - (D) The mating between members must be free
23. Nerve endings are located in which part of tooth
 - (A) crown (B) Cement (C) Pulp cavity (D) Gum
24. Grasping fingers and toes as well as eyes positioned in front of the head are features of
 - (A) Cetaceans (B) Carnivores
 - (C) Rodents (D) Primate
25. One of the major difference between DNA and RNA is that
 - (A) DNA is made of ribose sugars and double stranded unlike RNA
 - (B) DNA is made of ribose sugar and single stranded unlike RNA
 - (C) RNA is made of ribose sugar and double stranded like DNA

(D) RNA is made of ribose sugar and single stranded unlike DNA

Answer Key

1. A 6. B 11. B 16. C 21. A
 2. D 7. D 12. C 17. A 22. A
 3. B 8. B 13. D 18. B 23. C
 4. - 9. C 14. D 19. B 24. D
 5. B 10. C 15. C 20. C 25. D

Explanations to Answers

- The chromatids are produced when the chromosomes shortens & thickens, so sister chromatids are two identical copies of a single chromosomes produced during cell division (A)
- Fungi is very important in the decay of organic matter (Saprophyte) & is very essential in the nutrient cycling
- Atoms → Macromolecules → Organelles → Cell → Tissues → Organs → Organ System → Organism (B)
- Homozygous Round (RR) x Homozygous wrinkled (rr)

First Filial generation

	r	r
R	Rr	Rr
R	Rr	Rr

Second Filial generation

	R	r
R	RR	Rr
r	Rr	rr

Therefore ; $\frac{1}{4}$ of the seed wrinkled
 $\Rightarrow \frac{1}{4} \times 7324 = 1831$

- A steep slope encourage fast run-off of water, therefore, encourage erosion, which result in shallow & infertile soil. A very steep slope will not allow sunlight to reach the plant at the lower side of the slope. Therefore, the steepness of the slope will affect all the options (D)
- Bacterial are prokaryotic cells, they lack definite nuclear membrane & materials (B)
- Hormones are produced from specific glands as we have insulin secreted from pancreas Gland (D)
- Population density = $\frac{\text{number of Organism}}{\text{Area}}$
 $= \frac{80}{100} = 0.80 \text{ per m}^2$ (B)
- Axial skeleton form the main central axis which are the skull, vertebral column, breast bone or sternum and ribs. Phalanges (part of limbs), Tarsal (part of hind limbs), Pentadactyl, the Knee cap (hind limbs) are part of appendicular skeleton. Sacrum is in the vertebra column which is also part of Axial Skeletons (C)

- Closed Circulatory system is when the blood is contained in the vessels. Insect and earthworm exhibit open and single circulatory system. Fishes exhibit closed & single circulatory system (C)
- Coelomates are organisms with a true body cavity (B)
- These four types of cells make up the Xylem. Xylem is the water conducting tissue which has a strengthening function (C)
- Photosynthesis, Respiration & decay involve both biotic & abiotic components of an ecosystem. Burning of fossil fuels is mainly abiotic (D)
- This is the latex, as we have in Rubber tree which secrete rubber Latex (D)
- This is Endoplasmic Reticulum, it helps in the packing & transports of proteins manufactured by ribosome (C)
- This is pastoral - farming, it is a traditional type of farming by keeping only livestock as cattle, sheep & goats. It is common among some tribes (C)
- A fruit which develop without fertilization is described as parthenocarpic (A)
- Phylum Annelida are the segmented worms with long cylindrical bodies, the segments have identical organs e.g Leeches and Earthworms. An arachnid has a body that is divided into two parts; a cephalothorax and an abdomen. The cephalothorax bears simple eyes, two pairs of appendages for feeding & four pairs of walking legs, a common one is spider (B)
- This is homeostasis, by using specialize organs like kidney, Liver, Skin & so on (B)
- Enamel is the white layer covering dentine in teeth, it is the harder than Bone (C)
- A caryopsis has the pericarp & the seed coat fused together e.g grains of cereals (maize) & grasses (A)
- The species is the smallest unit of classification the individual within a species identical in general appearance. They can mate with one another & produce fertile offspring. They can not necessarily live in one place (A)
- The centre of the tooth consist of a pulp cavity. It contains blood vessels & nerves which are extremely sensitive to heat & cold (C)
- These are the features of primates (D)
- The DNA molecule consist of two strands that curve spirally to form double Helix structure, the sugar is deoxyribose while RNA is a single strand consisting of ribose sugars instead of deoxyribose sugars in DNA (D)

1. The number of cranial nerves that connect the brain to various parts of the body is
A. 10 pairs B. 11 pairs C. 12 pairs D. 13 pairs

The following pair of ions is involved in transmission of impulses by neurons. A. K and Na ions

B. Na and Mg ions C. K and Cl ions D. K and Ca ions

The probability of producing an heterozygote progeny in a cross between two heterozygote individuals of pea plant is A. $\frac{1}{3}$ B. $\frac{1}{4}$ C. $\frac{1}{2}$ D. $\frac{2}{3}$

One of these does not protect the body from harmful effect of disease – causing micro organism.

A. Anti toxin B. Phagocytes C. Antigens D. Antibodies.

Which of these statements with respect to "individual organism" is most correct?

A. It refers to animals B. It refers to either the plants or animals. C. Its ecology can be carried out in zoo only

D. It is used in reference to plant only.

6. One of these is not a major Biome in West Africa

A. Rain forest B. Savanna

C. Coniferous forest D. Mangroove.

7. The media of transportation in living things include all but A. Cytoplasm B. Water C. Eosin D. Blood and lymph

8. Gaseous exchange through the lungs is called

A. cutaneous breathing B. buccal breathing

C. pulmonary breathing D. larynxial breathing.

9. In saprophytic mode of nutrition

A. organisms feed on insoluble organic material

B. decomposition is not possible at all C. nutrient recycling is possible D. no animal is involved

10. A macro element which is not directly connected with formation of chlorophyll is

A. nitrogen B. iron C. magnesium D. sulphur

11. During the light dependent reaction

A. glucose is formed B. carbon IV oxide is fixed

C. NADPH and ATP are synthesized using electron release from water D. water is split and the electrons produced are used for glucose synthesis

12. Eutrophication refers to growth of

A. Bacteria B. fungi C. protophytes D. algae

13. All the following statements are consistent with the concept of trophic structure except A. At every feeding stage some energy is wasted from the chain B. The nearer the organism to the beginning of a food chain, the greater the available energy of the organism C. The first trophic level is occupied by the autotrophs D. There are few number of organisms at the start of a food chain.

14. All these statements about plant succession are correct except

A. Plant succession is the process of community change at one place over time B. Plant succession is usually measured over the course of several years to hundred years C. Succession proceeds from pioneer to climax phases D. Succession is often not directional and so difficult to predict

15. Which of the following is not true about finger print?

A. It is useful in detecting crime B. No two individuals have the same finger print C. It is a heritable character

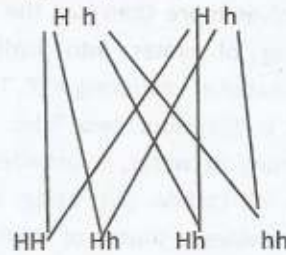
- D. It is environmentally induced
- Characteristics of continuous variation include all of the following except
 - produced by many genes
 - influence by the environment
 - occurs in a normal distribution curve
 - most of the organisms in the population fall at the tail end of the range
 - Homeostasis is defined as
 - regulation of both external and internal condition of organisms
 - maintenance of internal environment of an organism
 - maintenance of internal and external environment of an organism
 - regulation of the chemical environment of an organism
 - Effectors are
 - muscles which work in response to the stimulus received from the motor nerves
 - glands which work in response to the stimulus received from the motor nerves
 - muscles or glands which work in response to the stimulus received from the motor nerves
 - efferent neurons
 - The mechanism of opening and closing the stomata is associated with the
 - guard cells
 - stoma
 - lenticels
 - air spaces
 - The part of the kidney where each tubule begins is called
 - capsule
 - cortex
 - glomerulus
 - urether
 - The factors for two pairs of contrasting characters are inherited independent of each other. This is
 - Mendel's first law of inheritance
 - Mendel's second law of inheritance
 - Mendel's law of segregation of germinal units
 - Mendel's law of independent pairing of germinal Units
 - All of the following green algae are colonial forms except?
 - Gonium
 - Volvox
 - Pandorina
 - Anabaena
 - Allele is
 - an alternate form of a gene
 - a unit of inheritance
 - the position or location of the gene on a chromosome
 - number of chromosome in the gamete
 - One of these statements about sympathetic Nervous system is untrue
 - It stimulates many parts of the body in times of danger
 - It stimulates the heart beat
 - It functions like adrenal gland
 - It lowers the blood pressure
 - One of the following elements is not associated with leaf chlorosis
 - Nitrogen
 - Iron
 - Calcium
 - Magnesium

EXPLANATIONS TO THE ANSWERS

- There are ten pairs of cranial nerves in primitive vertebrates, twelve pairs in mammals (including human being). In humans, 12 pairs of cranial nerves arise from the ventral surface of the brain and leaves it through opening in the skull (C)
- A nerves impulse is a wave of electrical activity travelling along the neurone. A resting neurone is actually generating electricity, it does this by pumping sodium ion

(Na⁺) out of the cell. As each sodium is pumped out of the cell, a potassium ion (K⁺) is pumped into the cell (A)

- For heterozygotes parent,



The heterozygous progeny are the two Hh progeny. The probability of having heterozygous progeny = $2/4 = \frac{1}{2}$ (C)

- Phagocyte literally means cell eater. This was first observed in white blood cells which take up bacteria and other germs by the process called phagocytosis. Antigens is present in each of the micro organism e.g polio virus. The micro organisms contains a wide range of macromolecules which act as Antigen and when a particular antigen get into the body it stimulates certain cells to produce a corresponding protein called Anti body. The antibody neutralizes the antigens, destroying the micro organism in the process. Anti toxins also neutralizes the toxins (C)
- Individual organisms refered to either plants or animals. These even include bacteria and viruses (B)
- Major parts of West Africa fall within the equatorial region of the world where rainfall is heavy. The biomes is majority tropical forest, swamp, mangrove and fresh water swamp. Coniferous forests experience cold temperate climate with light rainfall and snow, it can be found in North America, part of Russia, Northern India, part of China etc (C)
- Water is a major component of living things, it helps in the distribution of material in living things. Blood is a liquid tissue containing cells suspended freely in a watery medium, lymfs and Eosins are components of blood and it is used as medium for transporting materials (digested food nutrients, oxygen, CO₂). Cytoplasm describes everything within the cell except nucleus, cytoplasm is not a means of transportation in the living cell (A)
- Cutaneous breathing is the exchange of oxygen through the skin as in the frog. Buccal breathing is the gaseous exchange through the buccal cavity as in toad. Gaseous exchange through the lung is called larynxial breathing because air from the mouth and nose passes through the larynx to the lung (D)
- Saprophytes are organisms that obtain their food from non living organic matter such as remain of plants and animals and their excretory products. Their feeding activities cause decay of organic matter. Saprophytes include bacteria and fungi such as mushrooms and moulds. These organisms feed on dissolved organic matter (e.g glucose and amino acids). These soluble end products diffuse into the hyphal wall where there are assimilated in the cytoplasm. This makes nutrient recycling possible (C)

10. Nitrogen, iron and magnesium are important in the formation of chlorophyll. Sulphur is important in the synthesis of some proteins in the cell (D)
11. The light stage involves more than just the splitting of water. The splitting of water into hydroxide and hydrogen ion are capable of producing ATP. The function of the light stage is therefore two folds: (i) by the photochemical splitting of water, it provides hydrogen atom for reduction of carbon (iv) oxide and (ii) by producing ATP, it provides a source of chemical energy for the subsequent synthesis of carbohydrates. Hydrogen atoms formed this way are taken up a hydrogen acceptor, nicotinamide adenine dinucleotide phosphate (NADP), which is thus reduced. The reduced NADP now enters dark stage, handing on the hydrogen which is then used in the reduction of carbon (iv) oxide. Note: glucose is produced in the dark stage. (C)
12. Eutrophication is the process by which a body of water acquires a high concentration of nutrients especially phosphates and nitrates. These typical promote excessive growth of algae. As the algae die and decompose, high level of organic matter and the decomposing organism depletes the water available oxygen (D)
13. The starting (the first trophic level) is a primary producer (i.e autotrophs) and energy is lost from one trophic level to another. In term of number the organisms at the starting point are largest and decrease progressively up the trophic level (D)
14. Succession refers to the series of gradual changes being carried out by plant and animal communities in an area, in which, with time, lower organisms are replaced by higher one. This process takes thousands of years. This succession which starts from primary bare rock and end up in the formation of a stable forest called primary succession. The final stage ever attained through the series of changes into is called the climax. From all the above mentioned, succession is predictable and directional. (D)
15. Finger print is unique in every individual, difference being recognizable in the patterns of the arches, loops, whorls and compounds. It is used in the detection of crime and unique to an individual. It is a continuous variation and inheritable. It is not affected by the environment. (D)
16. Continuous variation is a type of variation in which a given feature shows a gradual transition between two extreme forms, examples are height, finger print, body weight. It involves combination of many genes, for example, calculation of the weight or height (of one sex) in a classroom will reveal a wide, unbroken range than at the extreme and with fewer individuals at the extremes. Some of the continuous character can be influenced by the environment, for example, weight, size and height can increase due to food and growth. (D)
17. Homeostasis is the maintenance of internal environment of an organism. (B)
18. An effector (muscle, gland) which responds directly or indirectly, to a stimulus. Most effectors are controlled by the nervous system and respond when they receive impulses from efferent nerves or motor nerves. (C)
19. The lower epidermis of the leaf is pierced by numerous pores or stomata, bordered by guard cells which can open or close of the pore, the stomata regulate the passage of CO₂, oxygen and water across the surface of the leaf (A)
20. The transverse section of the kidney shows an outer cortex beneath which is the medulla and beneath the medulla, the hollow pelvis of the kidney. Each urinary tubule begins in the cortex as a cup – like structure called the Bowman's capsule.(B)
21. Mendel's first law of heredity states that heredity characters of an organism are determined by genes which are discrete unchanging unit of inheritance and if a diploid organism has two different alleles (heterozygous) for a character, one allele may be dominant, dictating the expression of the character to the complete exclusion of other. Mendel's second law of heredity (independent assortment of genes) states that during gamete formation, the way one pair of alleles for a given character distributes itself in the gamete does not affect the way other allele pair distribute themselves i.e allele on different chromosomes assort independently during meiosis(B)
22. Green algae are unicellular micro organism when they joined together with their membrane to form Colonial. The colonial chlamydomonas is called Volvox. **Gonium** is a genus of colonial algae, a member of the order volvocales, typical colonies have 4 to 16 cells, all the same size arranged in a flat plate, with no anterior – posterior differentiation. **Pandorina** is a genus of green algae composed of 8, 16 or sometimes 32 cells, held together at their bases to form globular colony surrounded by mucilage. The cells are ovoid or slightly narrowed at one end to appear pear – shaped. **Anabena** is a genus of filamentous cyanobacteria that exist as plankton. It is known for its nitrogen ability and they form symbiotic relationships with certain plants. **Volvox** is a genus of chlorophytes(like chlamydomonas) a type of green algae. It forms spherical colonies of up to 50,000 cells. Therefore, Anabene is a filamentous algae not colonies. (D)
23. Allele is one of two or more alternative of a gene (A)
24. Sympathetic nervous system dominates in times of emergency or prolonged exertion i.e they prepare the body for stress and stimulate heart beat. They also work like adrenal gland, so the blood pressure cannot be lowered(D)
25. Chlorosis is a condition in which leaves produce insufficient chlorophyll. As chlorophyll is responsible for the green colour of leaves, chlorotic leaves are pale, yellow or yellow-white. It is caused by deficiency of Fe, Mg, N or spray of herbicides. Calcium is not needed in the production of chlorophyll (C)