

Directions: Choose the letter that corresponds to the correct answer.

1. Another very important cycle is the Water Cycle. All living things need water to live. This cycle has four main processes. The two processes that return water to the earth are:

- A. evaporation and condensation
- B. condensation and precipitation
- C. transpiration and condensation
- D. evaporation and transpiration

2. Which of the following is the smallest organelle in the cell?

- A. Golgi body
- B. Nucleus
- C. Mitochondrion
- D. Ribosome
- E. Chloroplast

3. Eggs and sperm are genetically very similar, but structurally very different. Why is this so?

- A. Both contain a haploid chromosome number, but eggs must provide nutrients for early development, while sperm must be able to move efficiently.
- B. Both contain a diploid chromosome number, but eggs must provide nutrients for early development, while sperm must be able to move efficiently.
- C. Both contain maternal chromosomes, but only sperm can control which chromosomes are passed on.
- D. Both contain a haploid chromosome number, but only eggs can control which chromosomes are passed on.

4. For a given diameter of an axon, one factor which increases the velocity of a nerve impulse is:

- A. the length of the axon.
- B. the ploidy of the nucleus.
- C. the density of mitochondria along the axon.
- D. maximal stimulation of the neuron.
- E. the presence of a myelin sheath.

5. How is a biochemical pathway regulated?

- A. The product of one reaction becomes the substrate for the next.
- B. The end product replaces the initial substrate in the pathway.
- C. The end product inhibits the first enzyme in the pathway by binding to an allosteric site.
- D. All of these are correct.

6. Which of the following chiefly stimulates action of the respiratory center?

- A. Carbon dioxide in the blood.
- B. Relaxin.
- C. Lack of oxygen in the blood.
- D. Inflation of the alveolus.
- E. Vagus nerve.

7. Replicate copies of each chromosome are called _____ and are joined at the _____

- A. homologues/centromere
- B. sister chromatids/kinetochore
- C. sister chromatids/centromere

D. homologues/kinetochore

8. The term motor unit refers to

- A. an entire muscle.
- B. a single muscle fiber.
- C. all the muscle fibers innervated by one nerve fiber.
- D. all the motor nerves in one muscle.
- E. all the sliding filaments of actin and myosin in one muscle fiber.

9. During which stage of meiosis does crossing over occur?

- A. prophase I
- B. anaphase I
- C. prophase II
- D. telophase II

10. An example of convergent evolution is

- A. Australian marsupials and placental mammals.
- B. the flippers in fish, penguins, and dolphins.
- C. the wings in birds, bats, and insects.
- D. all of these.

11. The human heartbeat is initiated within the

- A. sinus venosus.
- B. Hensen's node.
- C. conus arteriosus.

- D. atrio-ventricular node.
- E. sino-atrial node.

12. Food chains and food webs are models in science which visually show us the different relationships within an ecosystem. The primary difference between the food chain and the food web is:

- A. a food chain shows how energy is stored
- B. a food web shows how energy is used
- C. a food web is a complex system of food chains
- D. a food chain is a combination of different food webs

13. The testicles of male mammals are suspended in the scrotum because:

- A. the optimum temperature for sperm production is less than the normal core body temperature of the organism.
- B. the optimum temperature for sperm production is higher than the normal core body temperature of the organism.
- C. there is not enough room in the pelvic area for the testicles to be housed internally.
- D. it is easier for the body to expel sperm during ejaculation.

14. In the nephron of the kidney, filtration occurs between

- A. Bowman's capsule and Henle's loop.
- B. the glomerulus and Bowman's capsule.
- C. the proximal tubule and Henle's loop.
- D. Henle's loop and the vasa recta.
- E. the peritubular network and the convoluted tubules.

15. The cytoplasm of an animal cell is divided by means of:

- A. A cleavage furrow.
 - B. A cell plate.
 - C. A cell membrane formed within the cytoplasm.
 - D. Mitosis.
16. Sexual and asexual reproduction usually differ in
- A. the ability of the new offspring to reproduce.
 - B. the rate at which mutations occur.
 - C. the amount of genotypic variation between parent and offspring.
 - D. the viability of offspring.
 - E. whether or not natural selection can occur.
17. The clean-up crew are the decomposers. Decomposers and scavengers get rid of the garbage and waste in an ecosystem. Decomposers differ from scavengers because they
- A. only eat dead organisms
 - B. do not eat dead organisms
 - C. break down larger organisms
 - D. only feed on dead plants and animals
18. If we could monitor the amount of total gonadotropin activity in pregnant women, we would expect
- A. high levels of FSH and LH in the uterus to stimulate endometrial thickening.
 - B. high levels of circulating FSH and LH to stimulate implantation of the embryo.
 - C. high levels of hCG in the uterus to stimulate endometrial thickening.
 - D. high levels of circulating hCG to stimulate estrogen and progesterone synthesis.

19. In watermelons, the unlinked genes for green color (G) and for short length (S) are dominant over alleles for striped color (g) and long length (s). Predict the phenotypes and their ratios for the cross $Ggss \times ggSs$.

- A. All green short.
- B. 1:2:1 green short: striped long: striped short.
- C. All striped long.
- D. 1:1:1:1 green short: striped short: green long: striped long.
- E. 1:1 green short: striped long

20. Long radishes crossed with round radishes result in all oval radishes. This type of inheritance is:

- A. Multiple alleles.
- B. Complete dominance.
- C. Co-dominance.
- D. Incomplete dominance.

21. Assuming no linkage, how many different kinds of gametes can be produced by an organism with the genotype $AaBbcc$?

- A. 32
- B. 16
- C. 8
- D. 6
- E. 4

22. Which blood type would not be possible for children of a type AB mother and a type A father?

- A. O.

- B. A.
- C. B.
- D. AB.

23. Under the five-kingdom classification, members of the kingdom Monera are generally separated from the members of all the other kingdoms by having

- A. heterotrophic nutrition versus autotrophic nutrition.
- B. unicellular organization versus multicellular organization.
- C. microscopic size versus macroscopic size.
- D. prokaryotic cells versus eukaryotic cells.
- E. parasite-host relationship versus predator-prey relationship.

24. The process in which water, in the water cycle, goes through a phase change, from a gas to a liquid, is called.

- A. evaporation
- B. transpiration
- C. condensation
- D. precipitation

25. Of the following, which group of invertebrates is apparently most closely related to primitive vertebrates?

- A. Annelida
- B. Mollusca
- C. Cnidaria
- D. Arthropoda
- E. Echinodermata