

**XPertSTEM Biology Sample Test Division 4 for Grade 9 & 10**

**1. What property makes phospholipids the ideal organic molecule to make up the cell membrane?**

- a. Phospholipids dissolve easily in water, so materials can pass through them without the need for energy.
- b. Phospholipids contain many mitochondria, so the cell membrane has all the energy it needs to undergo mitosis.
- c. Phospholipids maintain their shape all the time, so organisms made from these cells can grow very large.
- d. **Phospholipids have hydrophobic and hydrophilic ends, so cells can live in an aqueous environment and still carry out all their functions.**

**2. The function of lipids is...**

- a. building cell membranes.
- b. long-term energy storage.
- c. insulation.
- d. **all of the above**

**3. How are enzymes denatured?**

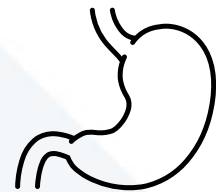
- a. water
- b. pH
- c. temperature
- d. **temperature and pH.**

**4. In anatomical position, .....**

- a. the body is erect with the feet parallel, and the arms lateral to the thoracic and abdominal regions, with the palms facing posteriorly
- b. the body is prone with the feet parallel, and the arms lateral to the thoracic and abdominal regions, with the palms facing posteriorly
- c. the body is supine with the feet parallel, and the arms lateral to the thoracic and abdominal regions, with the palms facing anteriorly
- d. **the body is erect with the feet parallel, and the arms lateral to the thoracic and abdominal regions, with the palms facing anteriorly**

**5. Which digestive organ mechanically and chemically transforms a food bolus into chyme?**

- a. **esophagus**
- b. small intestine
- c. large intestine
- d. stomach



**6. Which blood vessels carry deoxygenated blood from the body's cells back to heart?**

- a. **veins**
- b. arteries
- c. arterioles
- d. capillaries

7. This type of muscle tissue contains intercalated discs...

- a. smooth muscle
- b. rough muscle
- c. skeletal muscle
- d. **cardiac muscle**

8. Chose the correct statement about the relationship between the notochord and nerve cord.

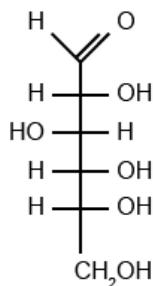
- a. **The nerve cord forms above the notochord.**
- b. The notochord forms above the nerve cord.
- c. The notochord and nerve cord form side by side.
- d. The notochord replaces the nerve cord.

9. Which mineral is a component of both proteins and nucleic acids??

- a. magnesium
- b. iron
- c. potassium
- d. **nitrogen**

10. Which organic molecule is represented by the structural formula below?

- a. sucrose
- b. fatty acid
- c. **glucose**
- d. starch



11. Which of these describes plants?

- a. heterotrophs
- b. **autotrophic eukaryotes**
- c. bacteria
- d. microorganisms

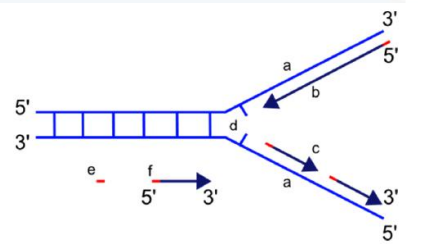
12. In addition to a gametophyte generation, all plants have a life cycle that contains which other stage?

- a. heteromorphic
- b. **sporophyte**
- c. vascular
- d. isomorphic

13. Which active transport is used for secretion and to help things exit the cell?

- a. **exocytosis**
- b. endocytosis
- c. pinocytosis
- d. phagocytosis

14. Which part of the DNA fragment is represented by the letter "d"?



- a. **replication fork**
- b. lagging strand
- c. RNA primer
- d. template strand

**XPertSTEM Biology Sample Test Division 4 for Grade 9 & 10**

15. In corn plants, having kernel color (c) is recessive to the gene that inhibits kernel color (C). Color appears when the homozygous condition is present. At a different locus, the dominant allele (P) results in purple kernels, whereas the recessive allele (p) results in red kernels, again when homozygous. If plants heterozygous for both loci are crossed, what will be the phenotypic ratio of the offspring?
- a. 4 colorless : 10 purple : 2 red
  - b. 12 colorless : 3 purple : 1 red**
  - c. 2 colorless : 2 purple : 12 red
  - d. 9 colorless : 5 purple : 2 red
16. A worm has a genotype of AaBbCcDd. Based upon this information, what are the possible genotypes of the parents?
- a. AABbCcDD and aabbccdd
  - b. AABbCCDD and aabbccdd
  - c. aaBbCcDd and aaBbCcDd
  - d. AabbCCDd and Aabbccdd**
17. The multicellular stage in which animals take the form of a ball is the...
- a. larva
  - b. blastospore**
  - c. blastula
  - d. body plan
18. When species interbreed, they often produce offspring that are...
- a. mobile
  - b. sterile**
  - c. sessile
  - d. fertile
19. What is cleavage?
- a. the succession of mitotic cell divisions without cell growth between the divisions**
  - b. another name for fertilization
  - c. a phase in meiosis
  - d. the exchange of DNA between chromosomes
20. The ocean floor region is the...
- a. pelagic zone
  - b. benthic zone**
  - c. mesopelagic zone
  - d. epipelagic zone
21. How does a person acquire a nosocomial disease?
- a. from being bitten by an infected insect
  - b. from being inside a health care facility**
  - c. from using a contaminated needle
  - d. from having unprotected sexual intercourse



22. How do lichens obtain their energy?



- a. through photosynthesis
- b. **by decaying organic matter**
- c. from parasitizing other plants
- d. from minerals in the soil

23. Which chordate subphylum is the largest, containing over 40,000 species?

- a. **Cephalochordata**
- b. Vertebrata
- c. Urochordata
- d. They are all the same.

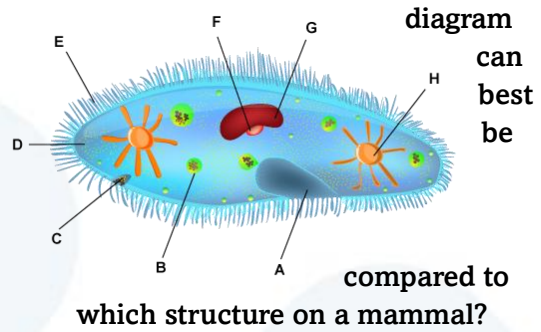
24. What does "Porifera" mean?

- a. **organisms with endoskeletons**
- b. shell-bearing animals
- c. pore-bearing animals
- d. organisms with a definite form

25. If you put a marine fish in freshwater, the fish is relative to the water.?

- a. **hypertonic**
- b. isotonic
- c. hypotonic
- d. equilibrated

26. Structure A on the paramecium



- a. legs
- b. brain
- c. **mouth**
- d. intestines

27. How can Legionnaire's disease be diagnosed?

- a. Common growth media can be used to see its characteristic growth.
- b. Fluorescent antibody procedures can be used.
- c. Staining of the bacterium can be seen under a microscope.
- d. **Various microbial agents can be applied to see how it reacts.**

28. What is a major role of saprobic fungi in a terrestrial ecosystem?

- a. trap atmospheric carbon dioxide
- b. parasitize plants and animals
- c. **break down carbon compounds**
- d. serve as pathogens for plants

29. A noncoding DNA strand of 10 base pairs was cut three different ways. The first way resulted in fragments of TG, ATG, CCTAC. The second way produced AT, GCC, and TACTG fragments. The third way produced CTG, CTA, and ATGC fragments. What is the correct sequence of the original piece of DNA?

- a. GTCATCCGTA
- b. **ATGCCTACTG**
- c. ATGACTGCCT
- d. GTCATGTACC

30. The pituitary gland, pineal gland, and thyroid gland are part of which system?

- a. nervous
- b. **endocrine**
- c. urinary
- d. lymphatic

