

NATIONAL SCIENCE LEAGUE – 2015

BIOLOGY CONTEST

- ANSWER KEY -

- | | |
|----------------------|----------------------|
| 1. <u> B </u> | 21. <u> C </u> |
| 2. <u> D </u> | 22. <u> A </u> |
| 3. <u> B </u> | 23. <u> A </u> |
| 4. <u> A </u> | 24. <u> B </u> |
| 5. <u> C </u> | 25. <u> D </u> |
| 6. <u> C </u> | 26. <u> A </u> |
| 7. <u> D </u> | 27. <u> A </u> |
| 8. <u> A </u> | 28. <u> A </u> |
| 9. <u> C </u> | 29. <u> A </u> |
| 10. <u> A </u> | 30. <u> C </u> |
| 11. <u> C </u> | 31. <u> A </u> |
| 12. <u> D </u> | 32. <u> C </u> |
| 13. <u> A </u> | 33. <u> B </u> |
| 14. <u> B </u> | 34. <u> C </u> |
| 15. <u> D </u> | 35. <u> D </u> |
| 16. <u> C </u> | 36. <u> D </u> |
| 17. <u> B </u> | 37. <u> D </u> |
| 18. <u> C </u> | 38. <u> A </u> |
| 19. <u> B </u> | 39. <u> B </u> |
| 20. <u> B </u> | 40. <u> D </u> |

Biology

1. After strenuous exercise, human sweat glands are activated, perspiration appears on the skin and body temperature is lowered. This reaction is an example of
 - A. respiration.
 - B. homeostasis.
 - C. synthesis.
 - D. secretion.

2. All animals that form a dorsal, solid notochord during embryological development are placed in phylum
 - A. Annelida.
 - B. Arthropoda.
 - C. Coelenterata.
 - D. Chordata.

3. The cell membrane is chiefly made of
 - A. cellulose.
 - B. protein and phospholipid.
 - C. DNA and amino acids.
 - D. lipid and carbohydrate.

4. The cellular organelle that functions as the site of cellular respiration is called the
 - A. mitochondrion.
 - B. nucleolus.
 - C. ribosome.
 - D. endoplasmic reticulum.

5. Which instrument would be useful to study the internal structure of a mitochondrion?
 - A. ultracentrifuge
 - B. light microscope
 - C. electron microscope
 - D. micro dissection apparatus

Biology

6. Which of the following plant structures *does not* have a waxy cuticle?
- A. leaf
 - B. herbaceous stem
 - C. root hair
 - D. petiole
7. Which is a correct statement about an autotroph?
- A. Autotrophs require a source of inorganic molecules.
 - B. Autotrophs make organic molecules from inorganic precursors.
 - C. Most autotrophs use light as an energy source.
 - D. All of these statements are true.
8. Lipids are digested to form fatty acids and glycerol by
- A. hydrolysis.
 - B. transformation.
 - C. denaturation.
 - D. dehydration synthesis.
9. Which of the following is a plant adaptation designed to capture light?
- A. + geotropism
 - B. - geotropism
 - C. + phototropism
 - D. - phototropism
10. After completing meiosis, the number of chromosomes in a cell
- A. is half the parent cell.
 - B. is the same as the parent cell.
 - C. is twice the parent cell.
 - D. varies from cell to cell.
11. Which of the following is most important in order for water to move from roots to leaves?
- A. root pressure and capillarity
 - B. turgor pressure and osmosis
 - C. transpiration pull and cohesion
 - D. osmotic pressure and active transport

Biology

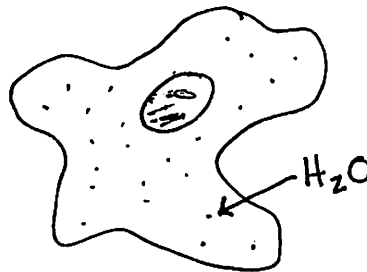
12. Which of the following is characteristic of the Kingdom Protista?
- A. multicellular; cells contain complex membrane-bound organelles
 - B. multicellular; cells contain no organelles
 - C. all unicellular; cells have no membrane-bound organelles
 - D. most unicellular; cells have complex membrane-bound organelles
13. In which part of the human digestive system does carbohydrate digestion begin?
- A. oral cavity
 - B. stomach
 - C. small intestine
 - D. large intestine
14. When photosynthesis is occurring, the openings of stomata in leaves becomes larger. This process results in the absorption of
- A. water vapor from the air.
 - B. carbon dioxide from the air.
 - C. oxygen from the air.
 - D. both carbon dioxide and oxygen from the air.
15. An open circulatory system is characteristic of
- A. Coelenterata.
 - B. Annelida.
 - C. Monera.
 - D. Arthropoda.
16. An individual with the triploid number of chromosomes would have
- A. double the normal number of chromosomes ($4n$).
 - B. three extra chromosomes ($2n + 3$).
 - C. an extra set of chromosomes ($2n + n$).
 - D. half the normal number of chromosomes (n).
17. Plants store glucose in the form of
- A. glycogen.
 - B. starch.
 - C. protein.
 - D. fat.

Biology

18. A fungus that derives its nutrition from dead organic matter is considered a

- A. predator.
- B. parasite.
- C. saprophyte.
- D. scavenger.

19. The diagram below represents an amoeba. The movement of water indicated by the arrows in the diagram take place by the process of



- A. pinocytosis.
- B. osmosis.
- C. active transport.
- D. dehydration synthesis.

20. Which person discovered and stated the fundamental laws of heredity?

- A. Darwin
- B. Mendel
- C. Watson
- D. Lamarck

21. Which element is normally *not* found in a polysaccharide?

- A. carbon
- B. hydrogen
- C. nitrogen
- D. oxygen

22. A multicellular organism possessing a cell wall and chlorophyll is a (an)

- A. plant.
- B. animal.
- C. fungus.
- D. bacterium.

Biology

23. Which gas do plants produce during photosynthesis?
- A. oxygen
 - B. carbon dioxide
 - C. both oxygen and carbon dioxide
 - D. neither oxygen nor carbon dioxide
24. Most ATP is made during
- A. fermentation.
 - B. aerobic respiration.
 - C. glycolysis.
 - D. the dark reaction.
25. Bones are directly connected to other bones by
- A. tendons.
 - B. flexors.
 - C. extensors.
 - D. ligaments.
26. The end product of starch digestion is
- A. glucose.
 - B. glycerol.
 - C. glycogen.
 - D. galactose.
27. The adrenal gland is part of which system?
- A. endocrine
 - B. digestive
 - C. respiratory
 - D. digestive
28. Which human disorder is characterized by the failure of blood to clot normally?
- A. hemophilia
 - B. anemia
 - C. thalassemia
 - D. phenylketonuria

Biology

29. During the Krebs cycle
- A. pyruvic acid is broken down to form carbon dioxide and water; ATP is formed.
 - B. water and carbon dioxide are combined to form pyruvic acid; no ATP is formed.
 - C. pyruvic acid is converted into glucose.
 - D. glucose is converted into pyruvic acid.
30. In flowering plants, the union of gametes normally occurs in the
- A. anther.
 - B. stigma.
 - C. ovary.
 - D. style.
31. Which group of organisms are *all* primary consumers?
- A. horse, cow, buffalo
 - B. frog, snake, hawk
 - C. grass, grasshopper, turtle
 - D. zebra, lion, antelope
32. The removal of undigested food is called
- A. secretion.
 - B. excretion.
 - C. egestion.
 - D. digestion.
33. The part of the human brain that regulates balance and coordination is the
- A. cerebrum.
 - B. cerebellum.
 - C. medulla.
 - D. corpus callosum.
34. In which organisms are the embryos *least* dependent on yolk for food?
- A. birds
 - B. fish
 - C. mammals
 - D. reptiles

Biology

35. Oogenesis normally occurs in the
- A. vagina.
 - B. uterus.
 - C. oviduct.
 - D. ovary.
36. A cross between two red flowers produces some offspring that are white. The red parents were probably
- A. homozygous.
 - B. dihybrid.
 - C. mutants.
 - D. heterozygous.
37. An RNA nucleotide would contain which of the following:
- A. thymine, deoxyribose, phosphate.
 - B. thymine, ribose, phosphate.
 - C. uracil, deoxyribose, phosphate.
 - D. uracil, ribose, phosphate.
38. The *least* diversity among organisms would be found in members of a
- A. species.
 - B. population.
 - C. community.
 - D. biome.
39. When chlorophyll absorbs light energy, the immediate effect is that it enables the plant to
- A. transport water molecules in xylem.
 - B. split water molecules in chloroplasts.
 - C. transform water molecules into sugar.
 - D. absorb water molecules from the soil.
40. Which of the following illustrates an appropriate food chain?
- A. grasshopper grass cow human
 - B. grass grasshopper frog snake
 - C. corn insect bird snake
 - D. both B and C are correct