



2013 Academic Challenge

BIOLOGY TEST - REGIONAL

This Test Consists of 50 Questions

Biology Test Production Team

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GENERAL DIRECTIONS

Please read the following instructions carefully. This is a timed test; any instructions from the test supervisor should be followed promptly.

The test supervisor will give instructions for filling in any necessary information on the answer sheet. Most Academic Challenge sites will ask you to indicate your answer to each question by marking an oval that corresponds to the correct answer for that question. Only one oval should be marked to answer each question. Multiple ovals will automatically be graded as incorrect answers.

Be sure ovals are marked as  , not  ,  ,  , etc.

If you wish to change an answer, erase your first mark completely before marking your new choice.

You are advised to use your time effectively and to work as rapidly as you can without losing accuracy. Do not waste your time on questions that seem too difficult for you. Go on to the other questions, and then come back to the difficult ones later if time remains.

***** TIME: 40 MINUTES *****

DO NOT OPEN TEST BOOKLET UNTIL YOU ARE TOLD TO DO SO!

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WYSE – Academic Challenge
Biology Test (Regional) – 2013

1. The more acidic a substance is the greater the concentration of _____.
 - a. water – H₂O
 - b. hydrogen ions – H⁺
 - c. hydroxide ions – OH⁻
 - d. salt – NaCl
 - e. carbon - C
2. Which of the following organs is **not** part of the excretory system?
 - a. ureters
 - b. urethra
 - c. urinary bladder
 - d. small intestine
 - e. kidney
3. Tropical rain forests are important biomes. Which of the following is **not** a characteristic of a tropical rain forest?
 - a. have a wet and dry season
 - b. precipitation comes from the transpiration of trees
 - c. very diverse groups of plant and animal life
 - d. nutrient poor soil
 - e. has a layering of trees or vegetation
4. The cuticle of a leaf _____.
 - a. is the area where most photosynthesis takes place
 - b. absorbs water
 - c. keeps water from evaporating
 - d. makes tissues like xylem
 - e. allows for gas exchange
5. Which of the following cell parts is **not** found in bacterial cells?
 - a. capsules
 - b. cell walls
 - c. cytoplasm
 - d. ribosomes
 - e. nucleus
6. Waxes, triglycerides, and oils are examples of _____.
 - a. inorganic molecules
 - b. carbohydrates
 - c. hydrophilic molecules
 - d. lipids
 - e. nucleic acids
7. A bat's wing and a dolphin's flipper are examples of _____ structures.
 - a. homoplastic
 - b. vestigial
 - c. homologous
 - d. hemizygous
 - e. analogous

8. Which of the following scientists named cells after observing cork under a microscope?
 - a. Gregor Mendel
 - b. Alfred Wallace
 - c. Robert Hooke
 - d. James Watson
 - e. Louis Pasteur

9. If a colorblind man marries a colorblind woman, what are the chances that their female children will be colorblind?
 - a. 0%
 - b. 25%
 - c. 50%
 - d. 75%
 - e. 100%

10. In RNA, complementary base pairing occurs between adenine and _____.
 - a. thymine
 - b. guanine
 - c. cytosine
 - d. uracil
 - e. none of the above

11. In plants, photosynthesis occurs in the _____.
 - a. chloroplast
 - b. cell wall
 - c. mitochondria
 - d. cristae
 - e. central vacuole

12. Which of the following statements is correct?
 - a. Plant cells reproduce asexually through a process known as binary fission
 - b. During cytokinesis, cleavage furrows are associated with animal cells
 - c. Prokaryotic cells have many membrane bound organelles.
 - d. Both b and c are correct.
 - e. All of the above are correct.

13. Special cells called _____ are stinging cells in jellyfish.
 - a. choanocytes
 - b. gland cells
 - c. colloblasts
 - d. flame cells
 - e. nematocysts

14. Which of the following is true?
 - a. Gel electrophoresis can separate molecules such as DNA and proteins according to size and charge.
 - b. RFLP is an abbreviation for restriction fragment length polymorphism.
 - c. PCR techniques amplify DNA.
 - d. cDNA has only exons present.
 - e. All of the above.

15. Which of the following is the **least** inclusive taxonomic category?
- Family
 - Phylum
 - Class
 - Genus
 - Order
16. An atom with three valence electrons, needs an additional ____ electron(s) in order to fill its shell.
- 5
 - 4
 - 3
 - 2
 - 1
17. Which of the following is part of an animal's plasma membrane?
- proteins
 - phospholipids
 - cholesterol
 - glycolipids
 - All of the above are part of an animal's plasma membrane.

18. Match the animals in **Column A** with the Class that they belong to in **Column B**.

Column A

- Dolphin
- Sea turtle
- Frogs
- Spiders
- Beetles

Column B

- Mammalia
- Reptilia
- Insecta
- Amphibia
- Arachnida

Select the correct matching sequence.

- 1 – i; 2 – ii; 3 – iv; 4 – v; 5 – iii
 - 1 – ii; 2 – i; 3 – iv; 4 – iii; 5 – v
 - 1 – i; 2 – iii; 3 – ii; 4 – iv; 5 – v
 - 1 – i; 2 – ii; 3 – iii; 4 – iv; 5 – v
 - 1 – i; 2 – ii; 3 – v; 4 – iv; 5 – iii
19. Which of the following statements is **not** true?
- Carbon – 12 and carbon – 14 have the same number of protons.
 - Carbon – 14 is just as stable of an element as carbon – 12.
 - Carbon – 14 is an isotope of carbon – 12.
 - Carbon – 14 has more neutrons than carbon – 12.
 - The atomic number of carbon – 12 and carbon – 14 is 6.
20. Cyanobacteria, algae, and ferns are examples of ____.
- consumers
 - saprobies
 - decomposers
 - producers
 - scavengers

21. Which organism is **not** matched with the domain in which it belongs?
- Eukarya – dog
 - Archaea – *E. coli*
 - Bacteria – *Staphylococcus aureus*
 - Eukarya – oak tree
 - Eukarya – mushroom
22. What are **all** the possible gametes for the following: AaBb?
- AB and ab
 - Aa and Bb
 - AB, Ab, aB, and ab
 - Ab, aa, BB, and aB
 - AA, aa, BB, and bb
23. _____ will be found in some plant cells, while _____ will be found in animal cells.
- Centrioles; chloroplasts
 - Plastids; chloroplasts
 - Chloroplasts; centrioles
 - Centrioles; plastids
 - Chloroplasts; cell walls
24. The building blocks of proteins are _____.
- amino acids
 - nucleotides
 - monosaccharides
 - fatty acids
 - alcohols
25. Fossils are _____.
- evidence for evolution
 - only formed from bones and teeth
 - easily formed by most organisms
 - used by forensic biologists
 - All of the above are true.
26. Some characteristics of _____ include: fibrous root system, flower parts in multiples of threes, and one cotyledon.
- dicots
 - gymnosperms
 - ferns
 - monocots
 - mosses
27. Grass → Sheep → Coyote
Which association is incorrect using the above food chain?
- sheep – 2nd trophic level
 - coyote – primary consumer
 - grass – producer
 - sheep – herbivore
 - grass – autotroph

28. The expected phenotype ratio for a monohybrid cross is ____.
- 9: 3: 3: 1
 - 1: 1: 1: 1
 - 2: 2: 1
 - 1: 2: 1
 - 3: 1
29. A DNA nucleotide would have ____.
- phosphate – deoxyribose – uracil
 - phosphate – ribose – uracil
 - phosphate – deoxyribose – thymine
 - phosphate – ribose – thymine
 - phosphate – deoxyribose – ribose
30. Dialysis is the ____.
- process of digestion
 - movement of solutes across a selectively permeable membrane
 - same as pinocytosis
 - process of moving substances from areas of low concentration to high concentration
 - Both b and d are correct.
31. The viceroy butterfly and the monarch butterfly resemble each other, this is an example of ____.
- cryptic coloration
 - mechanical defenses
 - mimicry
 - blending into their environment
 - None of the above.
32. Which cell part is **not** matched with its function?
- ribosome – protein synthesis
 - centrioles – stores extra water
 - contractile vacuoles – rid extra water
 - nucleus – control center
 - mitochondria – makes ATP
33. Coral, jellyfish, and hydra are in Phylum ____.
- Arthropoda
 - Annelida
 - Mollusca
 - Cnidarian
 - Ctneophora
34. The final electron acceptor in aerobic respiration is ____.
- carbonate
 - nitrate
 - oxygen
 - glucose
 - pyruvate

35. During the ____ stage of mitosis, chromosomes will line up at the cell's equator.
- interphase
 - metaphase
 - cytokinesis
 - telophase
 - prophase

36. Which is **not** an example of an organic molecule?

- CO₂
- CH₄
- C₂H₄
- C₂NH₇
- C₆H₁₂O₆

37. Match the enzymes in **Column A** with the food it will digest in **Column B**.

Column A

- pepsin
- amylase
- lipase
- trypsin

Column B

- protein
- starch
- fats

Select the correct matching sequence.

- 1 – iii; 2 – ii; 3 – iii; 4 – i
- 1 – i; 2 – ii; 3 – iii; 4 – i
- 1 – i; 2 – iii; 3 – ii; 4 – i
- 1 – i; 2 – ii; 3 – i; 4 – iii
- 1 – ii; 2 – i; 3 – iii; 4 – ii

38. An isotonic solution would ____.

- have the same concentration of water inside and outside the cell
- have a greater concentration of water inside the cell than outside the cell
- have more water inside the solution than inside the cell
- add turgor pressure to plant cells
- cause an animal cell to shrink in size

39. ____ cleave DNA at specific sequence sites for recombinant DNA research.

- Polymerase
- Ligase
- Centrioles
- Restriction enzymes
- None of the above

40. If chlorine has 17 electrons and 18 neutrons, which of the following is true?

- It has 2 valence shell electrons.
- It has an atomic number of 17.
- It has an atomic weight of 35.
- Both b and c are correct.
- All of the above are correct.

41. A hypothesis ____.
- should be stated so it can be proven true
 - is the same as a prediction
 - must have a control group
 - is the same as a scientific law
 - should be stated so it can be falsified
42. Which of the following best describes genotype?
- the outward appearance of an organism
 - changes in the DNA
 - the pairs of genes an organism has
 - the crossover rate
 - pink flowers
43. The ____ stage of plants is haploid.
- sporophyte
 - zygote
 - seed
 - embryo
 - gametophyte
44. Which of the following is **not** correctly matched?
- WHO – Whole Health Organization
 - CDC –Centers for Disease Control and Prevention
 - EID – emerging infectious disease
 - MRSA – methicillin-resistant *S. aureus*
 - HIV – human immunodeficiency virus
45. Blood does **not** usually contain ____.
- plasma
 - white blood cells
 - bacteria
 - platelets
 - red blood cells
46. ____ picks up the code from DNA.
- mRNA
 - tRNA
 - rRNA
 - snRNA
 - miRNA
47. Plant roots have a protective layer called the ____.
- meristematic region
 - elongation stage
 - mitotic area
 - root cap
 - maturation region

48. Enzymes are ____.
- a. used up during a chemical reaction
 - b. protein catalysts
 - c. used in only a few chemical reactions
 - d. found only in eukaryotes
 - e. not affected by pH changes
49. In guinea pigs, short hair (H) is dominant to long hair (h). If a long haired female was mated to a short haired male and the litter had both short and long haired offspring, then the genotype of the male would be ____.
- a. HH
 - b. hh
 - c. Hh
 - d. either a or c
 - e. none of the above
50. Estuaries are ____.
- a. aquatic ecosystems where fresh water and salt water meet
 - b. transitional wetlands between prairies and rivers
 - c. nutrient poor
 - d. stable environments without changes in salinity
 - e. found between the shoreline of low and high tide