BIOL 1400 **NAME: ANSWER KEY**

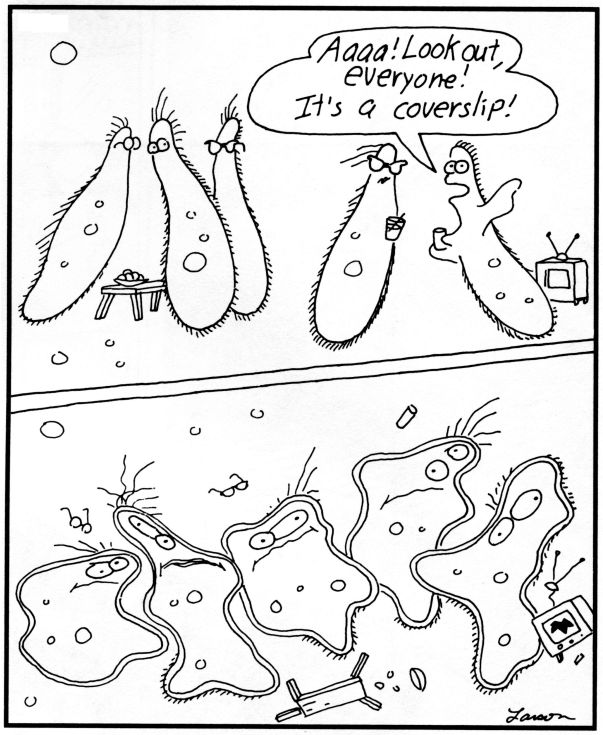
Biology for General Education **LAB: _____**

This exam consists of fifty multiple-choice questions. Each one has only one right answer. Read each question and all possible answers carefully before answering. If you have any difficulty understanding a question, raise your hand and I will answer as best I can.

Please mark your answers on the Scantron form provided, using only #2 lead pencil. If you erase an answer, make sure you erase it fully, or the machine may mark it incorrect. Always check to ensure that your answers are on the correct rows on the Scantron form. Please keep your eyes on your own work: the penalty for cheating, if detected, will be an automatic grade of zero on this exam.

Turn in **both** the Scantron form **and** the test paper when you are finished. Make sure your name is on both. You may write on the test itself if you wish, but anything you write on the test paper will not be graded.

Good luck.



Life on a microscope slide

1. The organism known as *Histoplasma capsulatum* has a two-part scientific name. Such a name is called a/an:

A. formula.
B. binomial name.
C. Kingdom.
D. nomen nudum.
E. informal name.

2. The 18th-century scientist who came up with the rules for officially naming species—rules that are still used today—was:

A. Steno.
B. Darwin.
C. Lyell.
D. Linnaeus.
E. de Sade.

3. *Histoplasma* refers to the _____ that this species is classified in.

A. kingdom
B. domain
C. clade
D. class
E. genus

4. Suppose that all that you know about *Histoplasma capsulatum* is that it has a cell wall. This means that it could be

A. a bacterium, fungus, or plant.
B. a protist or a fungus.
C. a plant or an animal.
D. a fungus or a plant.
E. an animal, plant, protist, or fungus.

5. *Histoplasma capsulatum* can cause disease in humans, growing in the tissue that lines the air spaces inside the lungs. This tissue would be _____ tissue.

A. connective
B. muscle
C. epithelial
D. nervous
E. parenchymatous

6. *Histoplasma capsulatum* is actually a fungus. That means that it must have

A. an extracellular matrix.
B. the ability to undergo photosynthesis.
C. no nucleus.
D. a slime capsule outside the cell.
E. a cell wall made of chitin.

7. *Histoplasma capsulatum* benefits from growing inside humans, but humans may be harmed by it. This means that *Histoplasma capsulatum* is a/an:

A. protist.
B. bacterium.
C. parasite.
D. mutualist.
E. eukaryote.

8. Doctors use a drug called itraconazole to treat infection with *Histoplasma capsulatum*. How could *natural selection* affect *H. capsulatum*?

A. *H. capsulatum* that happened to be resistant to itraconazole would survive, reproduce, and eventually become more common.
B. *H. capsulatum* would become more complex over many generations.
C. *H. capsulatum* would develop a thicker cell wall.
D. *H. capsulatum* would be completely unaffected by natural selection.
E. *H. capsulatum* would lose its resistance to itraconazole over many generations.

9. *Histoplasma capsulatum* grows in the body in the form of round cells, rather than long filaments. For this reason, we would call *H. capsulatum* a type of

A. cocci.
B. prokaryote.
C. yeast.
D. bacterium.
E. protist.

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10. What's Dr. Waggoner's office number?

A. 126 Lewis Science Center.
B. 1600 Pennsylvania Avenue.
C. 133 Mashburn Hall.
D. 102 Lewis Science Center.
E. 020 Lewis Science Center.

11. *Helianthus tuberosus*, the "Jerusalem artichoke" plant, produces underground stems that are large, swollen, and used for storing nutrients. Such underground stems are called

A. tubers.
B. roots.
C. haustoria.
D. fruit.
E. petioles.

12. "Jerusalem artichokes" have been cultivated for thousands of years. Growers have picked the plants with the largest, tastiest stems and encouraged only those plants to reproduce. This is a case of

A. metabolism.
B. photosynthesis.
C. epistasis.
D. artificial selection.
E. differentiation.

13. Which of these chemical elements are *not* major components of all life as we know it?

A. carbon and nitrogen
B. calcium and iron
C. hydrogen and oxygen
D. All of the above elements are major components of all life.
E. None of the above elements are major components of all life.

14. Gelatin (yes, including Jell-O) is made by long boiling of animal hides and bones. This releases the major component of animals' *extracellular matrix,* the substance

A. collagen.
B. chitin.
C. peptidoglycan.
D. cellulose.
E. silica.

15. The bacterium *Corynebacterium diphtheriae* causes the disease *diphtheria* when it releases a toxin, which circulates throughout an infected human's body. This is an example of a/an

A. aflatoxin.
B. extracellular matrix.
C. exotoxin.
D. capsule.
E. antibiotic.

16. A "medicine" that has no real effect on the body, but that makes you feel better because your state of mind strongly influences how your body feels, is called a/an:

A. antibiotic.
B. nociceptor.
C. antibody.
D. analgesic.
E. placebo.

17. *Typhlichthys subterraneus*, the southern cavefish, lives in permanent and total darkness, in streams that flow through caves. It has tiny eyes, but these eyes cannot sense light, cannot move, and in fact are buried under the skin of the head. These eyes would be an example of

A. artificial selection.
B. convergent evolution.
C. speciation by vicariance.
D. eukaryotic nuclei.
E. vestigial structures.

18. The animal phylum called the Arthropoda includes

A. flobberworms and blast-ended skrewts.
B. roundworms and flatworms.
C. vertebrates and invertebrates.
D. starfish and sand dollars.
E. insects and spiders.

19. The simple catch-phrase that sums up Charles Lyell's concept of *uniformitarianism* is

A. "survival of the fittest."
B. "the present is the key to the past."
C. "*post hoc, ergo propter hoc*."
D. "ontogeny recapitulates phylogeny."
E. "all living things are composed of cells."

20. Green plants (and some other organisms) get their energy by harnessing the sun in a process called

A. catabolism.
B. heterotrophy.
C. photosynthesis.
D. sporulation.
E. parasitism.

21. Which of these statements is *not* a scientific hypothesis?

A. Alien spacecraft from other planets have landed on Earth.
B. The ancient continent of Atlantis sank below the ocean thousands of years ago.
C. People can communicate with each other by reading each other's thoughts.
D. Unicorns are the most beautiful of all magical creatures.
E. Mermaids live in crystal palaces at the bottom of the ocean.

22. The ship *HMS Beagle* visited the _____ Islands in 1835, off the coast of Ecuador.

A. Galápagos
B. Lofoten
C. Japanese
D. Caribbean
E. Hebrides

23. A pizza parlor offers a Sporocarp Special on the menu. This pizza would have

A. mushrooms.
B. spinach.
C. tomatoes.
D. cheese only.
E. beef.

24. Bacteria that are shaped like tiny spirals are known as

A. cocci.
B. protists.
C. bacilli.
D. hyphae.
E. spirilla.

25. You may remember that soon after the terrorist attack of 9/11, there was another scare when a white powder was anonymously mailed to several newspaper and government offices. The powder turned out to be the bacteria that cause the dangerous disease *anthrax*. However, these "powdered" bacteria weren't active—they were in "suspended animation" states known as

A. cocci.
B. organelles.
C. archaeans.
D. endospores.
E. hyphae.

26. If I told you to find me a *meristem*, where would be the best place to look?

A. On the tip of a plant stem.
B. In a pile of rotten fruit.
C. In a sample of pond water.
D. On the surface of a leaf.
E. Up your own nose.

27. Evolution has never been proven true.

A. Therefore, it's false.
B. This means that it's only a hypothesis.
C. This is normal, since nothing is ever proved true in science.
D. It must be a religious belief.
E. It can't be tested experimentally.

28. For natural selection to work, living things must have _____, which must be _____.

A. souls; immortal.
B. cells; eukaryotic.
C. tissues; epithelial.
D. variation; heritable.
E. fossils; ancient.

29. In this class, if you miss an assignment for an excused reason, what happens?

A. You can do the assignment later, when you return to class.
B. You can make up the points by writing a short essay on a subject that the professor will assign.
C. You can take the assignment home and make it up there.
D. You can make up the points by writing a short essay on anything you wish.
E. The assignment is dropped completely from your grade, and your grade is prorated.

30. The French scientist Georges Cuvier, studying fossil bones, documented a shocking fact:

A. all living things were made of cells.
B. some living things had gone extinct.
C. rock layers were arranged in the order in which they formed.
D. organisms known as eukaryotes contained nuclei.
E. the Earth is 4.6 billion years old.

31. To be considered "scientific", a hypothesis *must be*

A. proved true.
B. a theory.
C. testable.
D. mathematical.
E. experimental.

32. Any structure in the human body made up of several types of tissue, integrated together for a particular function, is a/an

A. gland.
B. organ.
C. system.
D. tumor.
E. cell.

33. Suppose an evolutionary biologist is interested in the evolution of whales. Which of the following would *not* be of much use in supporting hypotheses of how whales evolved?

A. The regions of the world where various whale species are found.
B. Fossil whales found in various rock layers.
C. The presence of tiny, useless remnants of leg bones inside a whale's body.
D. Similarities between whale anatomy and the structure of other animals.
E. All of the above would potentially be useful for studying whale evolution.

34. Which of the following is *not* primarily made up of *connective tissue*?

A. Your bones.
B. Your brain.
C. The flexible part of your nose.
D. Your Achilles tendon (thick ropelike structure at the back of your heel).
E. Trick question! All of the above are made of connective tissue.

35. The *flagella* of bacteria are structures that enable bacteria to

A. swim.
B. have sex.
C. feed.
D. be protected.
E. cause diseases.

36. Which of these is an example of a *mycelium*?

A. A single colony of bacteria growing on a Petri dish.
B. The loose fibrous network that holds animal cells together.
C. Specialized waxes that cover and protect plant leaves.
D. The thin, tubelike "sex organs" of bacteria.
E. The fuzzy whitish stuff growing on very old, spoiled food.

37. Which of these is an example of a *bryophyte*?

A. An oak tree.
B. A mushroom.
C. A moss.
D. A rose.
E. A bacterium.

38. Bryophytes are grouped together because they lack:

A. vascular tissue.
B. cell walls.
C. nuclei.
D. cellular differentiation.
E. extracellular matrix.

39. The total set of complex chemical reactions in a living thing, which build up and break down complex molecules and extract and use energy, is called

A. ecology.
B. evolution.
C. embryology.
D. metabolism.
E. differentiation.

40. *Heredity* can be defined as

A. the chemical composition of living organisms.
B. the types of cells that a living organism is composed of.
C. the ways in which living organisms interact in their environment.
D. the evolutionary history of living organisms.
E. the way in which organisms pass on their features to later generations.

41. To be classified as a eukaryote, an organism must not only have nuclei in its cells, but must also have

A. organelles in its cells.
B. cell differentiation.
C. cell walls surrounding its cells.
D. DNA in its cells.
E. organs in its body.

42. A recent study showed that countries in Europe where guns are allowed have lower crime rates than countries where guns are banned. If we assumed, without any more supporting evidence, that gun ownership *caused* crime rates to drop,

A. we'd be exactly right.
B. we'd be committing the fallacy of *post hoc ergo propter hoc*.
C. we'd have created an untestable hypothesis.
D. we would have proved a scientific theory.
E. we would have discovered a new scientific law.

43. The material known as *cellulose* makes up the cell walls of

A. animals.
B. vertebrates.
C. fungi.
D. invertebrates.
E. plants.

44. The "Law of Succession", in geology, deals with

A. the origin of rock layers.
B. the position of rock layers.
C. evolution by natural selection.
D. the order of appearance of fossils over time.
E. the minerals that make up rocks.

45. Which of the following organisms is an *extremophile*?

A. *Chironex fleckeri*, a deadly poisonous jellyfish living in the tropical Pacific
B. *Sulfolobus sulfataricus*, an archaean that grows in volcanic hot springs up to 175°F (80°C) and as acidic as household vinegar
C. *Yersina pestis*, a bacterium that causes bubonic plague, a lethal disease
D. *Macrocystis pyrifera*, a giant brown seaweed that reaches 60 meters (196 feet) in length
E. *Acanthomintha duttoni*, a wildflower found only in one six-mile strip of land in San Mateo County, California—and nowhere else in the world

46. "Steno's Law of Superposition" states that

A. evidence in rocks that formed in the past can be explained by looking at processes happening today.
B. organisms change over time due to natural selection.
C. in an undisturbed stack of rock layers, the oldest rocks are on the bottom of the stack, and the youngest are on the top.
D. the order in which fossil species appear and disappear in the rock record is basically the same over wide areas of the Earth.
E. correlation does not equal causality.

47. Fungi that live inside plant root tissues, taking nutrients from the plant but supplying important minerals to the plant in return, are called

A. mycorrhizae.
B. parasites.
C. sporocarps.
D. bacteria.
E. protists.

48. There is a certain bacterium called *Streptobacillus*. The *strepto-* part of the name tells you that this bacterium grows in

A. clusters.
B. pairs.
C. pyramids.
D. chains.
E. squares.

49. The *-bacillus* part of the name *Streptobacillus* tells you that this bacterium's cells are shaped like

A. spirals.
B. rods.
C. cones.
D. spheres.
E. commas.

50. The University of Central Arkansas is located in which state of the United States?

A. Arkansas
B. The Shire
C. Mordor
D. Lothlórien
E. Númenor