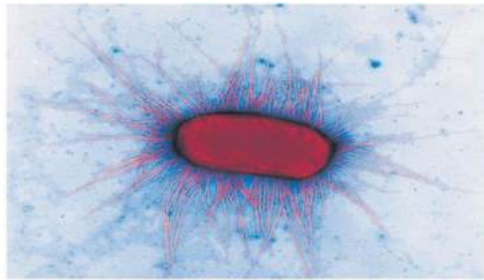


BRCC BIOL 121 FINAL SPRING 2015

1. E coli is a shortened name for a bacterium that lives in our gut. According to the rules of binomial nomenclature it is properly written as \_\_\_\_\_.
  - a. Escherichia COLI
  - b. Escherichia Coli
  - c. *Escherichia coli*
  - d. *escherichia coli*
  - e. escherichia coli
  
2. What does the term “biodiversity” refer to in the field of biology?
  - a. Total number of species on earth
  - b. Genetic variation that exists within populations all of the earth’s species
  - c. Total number of Earth’s ecosystems
  - d. All of the above are correct
  
3. Prokaryotic cells are classified in Domain(s) \_\_\_\_\_.
  - a. Archaea
  - b. Bacteria
  - c. Eukarya
  - d. Archaea and Bacteria
  - e. Archaea, Bacteria and Eukarya

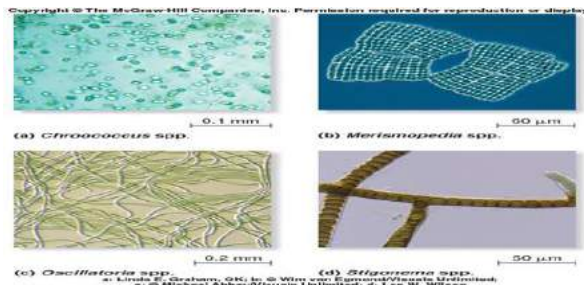
4.



4. The shape of this bacterium is \_\_\_\_\_ and the attachment filaments radiating out are called \_\_\_\_\_
- a. bacillus..... flagella
  - b. coccus..... cilia
  - c. spirilla..... pili
  - d. bacillus..... pili
  - e. vibrio..... cilia

5. A certain bacterium can withstand heating, drying and toxic chemicals that would kill most other bacteria. This indicates that it is probably able to form a \_\_\_\_\_.
  - a. Pseudopodia
  - b. Conjugation tube
  - c. Endospore
  - d. Flagellum
  - e. Endotoxins

6.

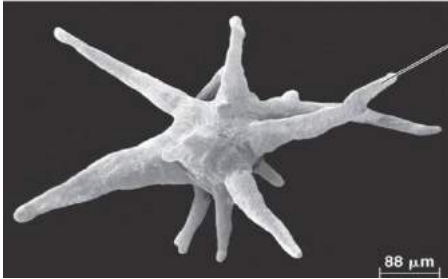


6. What ecological role is played by cyanobacteria ?
- a. photosynthetic producers that make sugar and pump oxygen into the atmosphere
  - b. decomposers of dead leaves and dead animals
  - c. chemosynthetic producers
  - d. pathogens of plants and animals

7. The term phytoplankton applies to photosynthetic, microscopic floating organisms such as \_\_\_\_\_
- Protozoan ciliates and flagellates
  - Aquatic plants
  - Dinoflagellates, diatoms and some unicellular or colonial green algae
  - Macroalgae and seaweeds
  - Fungus like protists such as slime molds

8. Which of the following statements is **false**?
- Most protists are aquatic.
  - Protists are eukaryotes.
  - Most protists are unicellular.
  - Protists have more complex cells than prokaryotes.
  - Photosynthetic protists are called protozoa.

9.



9. Which of the following structures is used by amoebas to move and to eat?
- microvilli
  - cilia
  - flagella
  - pseudopodia
  - tendrils

10. Into what kingdom do we place multicellular heterotrophic eukaryotes that acquire food by absorption from the environment and have cell walls made of chitin?
- Plantae
  - Animalia
  - Protista
  - Fungi
  - Proteobacteria

11.



11. (See image to the left) A fungus surrounding a root absorbs food from the plant and in turn this fungus provides water and minerals to the plant. This is a \_\_\_\_\_ relationship?
- parasitic
  - commensalistic
  - predatorial
  - mutualistic
  - competitive

12. (See image above). A fungus growing together with a plant root in a way that benefits both is a(n) \_\_\_\_\_
- Lichen
  - Epiphyte
  - Mycorrhizae
  - Hemiparasite
  - Halophyte

13. Which group shares the most recent common ancestor with land plants?

- a. Fungi
- b. Cyanobacteria
- c. Brown algae
- d. Green algae - charophytes
- e. Filamentous Bacteria

14.

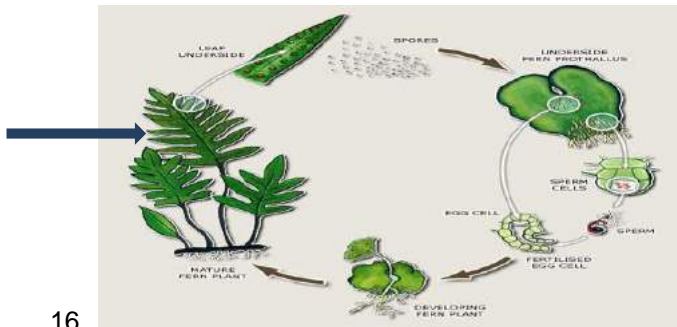


14. The part of the moss the arrow points to is the \_\_\_\_\_ and it produces spores by \_\_\_\_\_

- a. male gametophyte.....mitosis
- b. female gametophyte.....meiosis
- c. sporophyte.....mitosis
- d. sporophyte.....meiosis

15. Which of the following plant features is an adaptation for survival and reproduction on land?

- a. Cuticle
- b. Seed
- c. Vascular tissue
- d. Pollen grain
- e. All of the above



16.

16. The arrow is pointing to a \_\_\_\_\_ in the life cycle of a fern?

- a. sporophyte
- b. female gametophyte
- c. male gametophyte
- d. zygote

17. Which of the following identifies all vascular plants that produce seeds?

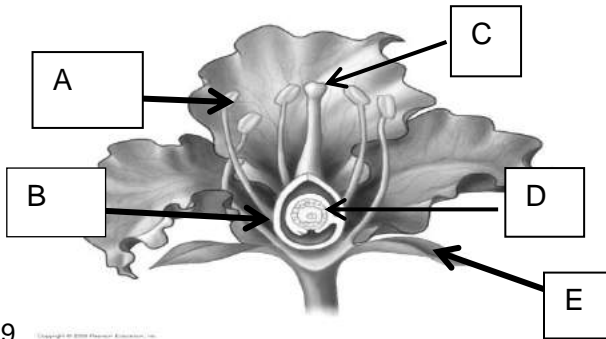
- a. Mosses and ferns
- b. Ferns and Gymnosperms
- c. Gymnosperms and Angiosperms
- d. Only mosses
- e. Only Angiosperms

18. (see image below)



18. The structure is called a(n) \_\_\_\_\_ and it belongs to the \_\_\_\_\_ part of the flower.

- a. stigma.....female
- b. anther..... male
- c. anther.....female
- d. stigma.....male
- e. pollen tube.....male



19. ( see diagram to right) Sperm nuclei are located in pollen produced at \_\_\_\_\_ and the egg is located within the \_\_\_\_\_

- a. C .....B
- b. A.....C
- c. A.....D
- d. D.....A
- e. B.....D

19.

20. The wood of trees is actually layers of \_\_\_\_\_

- a. Vascular cambium
- b. Cork cambium
- c. Secondary phloem
- d. Secondary xylem
- e. Cork

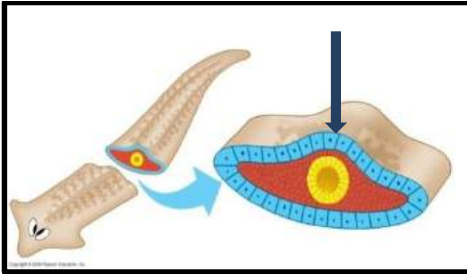
21. Corn kernels, peppers, tomatoes and cucumbers all contain seeds and are derived from the ovary of a flowering plant; therefore in botanical terms, they are \_\_\_\_\_

- a. Fruits
- b. Modified Stems
- c. Modified leaves
- d. Sepals
- e. None of the above

22. Which of the following statements **do not** apply to all animals?

- a. Animals are multicellular
- b. Animals are heterotrophic
- c. Animals are multicellular
- d. Animals have tissues and organs
- e. Animals are eukaryotes

23. A marine biologist finds a small animal at the bottom of the ocean that is uniformly segmented with short stiff bristles and soft skin. It has a complete digestive system and a circulatory system but no exoskeleton. Based on this description, this animal sounds like it is a(n)\_\_\_\_\_
- Flatworm
  - Nematode
  - Eel
  - Annelid
  - Squid



24.

24. Examine this diagram of a planarian. It is a(n)\_\_\_\_\_
- acoelomate
  - pseudocoelomate
  - coelomate

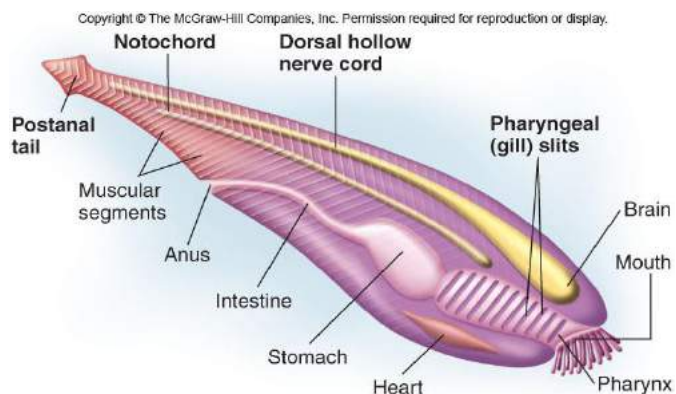
25. (See the arrow pointing to the outer layer of cells in the planarian) What is this germ layer called?

- Endoderm
- Mesoderm
- Ectoderm
- Placoderm
- Pachyderm

26. Which reptilian adaptation enables reptiles to reproduce on land?

- Lungs
- Endothermic metabolism
- An amniotic egg
- Four legs
- Three chambered heart

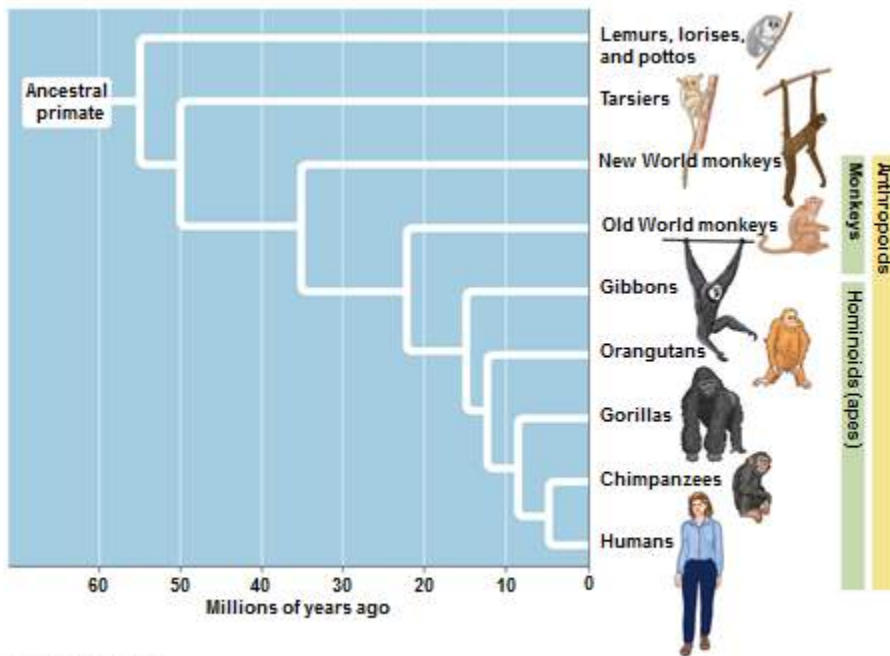
27. (See image below)



27. This invertebrate lancelet belongs in Phylum \_\_\_\_\_ based on its key characteristics.

- Vertebrata
- Agnatha
- Chondrichthyes
- Chordata
- Mollusca

28. (See evolutionary tree below)



28. Based on this evolutionary tree,

Which primates are the most primitive?

- Lemurs , lorises, and pottos
- Old world monkeys
- Apes
- New world monkeys
- tarsiers

29. Which unique feature distinguishes the members of the lineage that gave rise to humans from other hominids including gorillas, chimpanzees and orangutans?

- Grasping hand
- Large snout nose
- Binocular vision
- Bipedal locomotion
- Knuckle walking

30. The “Out of Africa” hypothesis proposes that the first modern humans evolved

- in multiple regions of the world outside of Africa
- in Africa and migrated to Asia and Europe
- outside of Africa and migrated into Africa

31. What group(s) of mammals has embryos that develop completely within the uterus while being nourished by the mother?

- Placental
- Marsupial
- Monotreme
- Both marsupial and Placental
- Both monotremes and marsupial

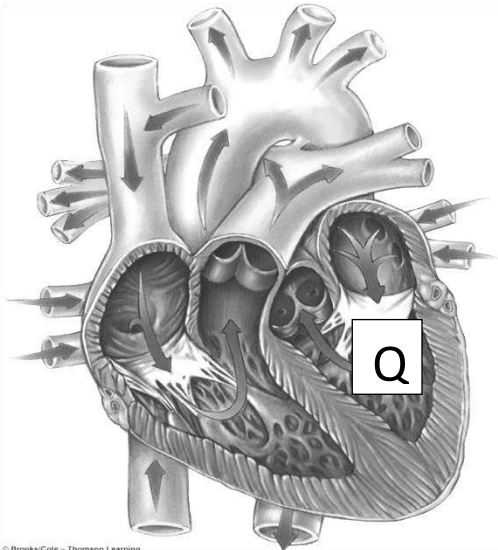
32. Which is an **incorrect** match of muscle tissue type with the organ?

- a. Cardiac muscle..... heart
- b. Smooth muscle ..... stomach
- c. Cardiac muscle..... Arteries
- d. Smooth muscle..... small intestines
- e. Skeletal muscles..... muscles attached to bones

33. What is an example of homeostasis?

- a. Skin is composed of all four tissue types.
- b. When sugar levels rise in the blood, the pancreas releases insulin to bring down the sugar levels.
- c. DNA is found in the nucleus of all eukaryotic cells
- d. When you exercise, your body temperature rises
- e. Hair grows at a constant rate.

34. (See heart below)



34. What is the name of the chamber labeled Q?

- a. right atrium
- b. right ventricle
- c. left atrium
- d. left ventricle

35. Where does this chamber Q pump blood next?

- a. pulmonary artery
- b. left atrium
- c. aorta
- d. pulmonary veins

35. (See heart above)

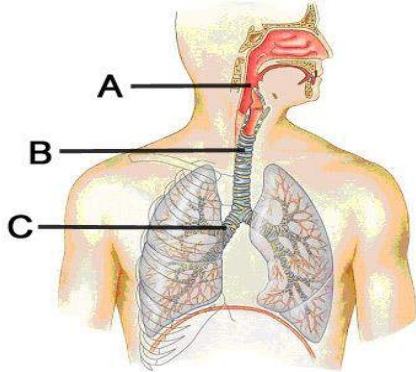
36. Which of the following lists traces the correct path of blood from the **Vena cava to the lungs**?

- a. Left atrium..... Left ventricle.....aorta
- b. Left atrium.....Left ventricle.....pulmonary veins
- c. Right atrium.....Right ventricle.....pulmonary arteries
- d. Right atrium..... Left ventricle..... Aorta
- e. Right atrium..... Right ventricle.....pulmonary veins



37. The respiratory surface of most organisms, such as alveoli in humans, must \_\_\_\_\_
- Be thin ( one cell layer thick)
  - Be moist
  - Have an extensive surface area
  - Allow diffusion of gasses
  - All of the above are true

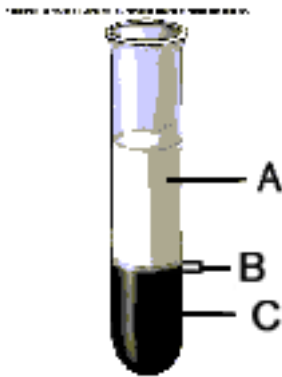
38. Label the respiratory structures shown in **Figure 4** by choosing the CORRECT set of labels.



38. Label the respiratory structures shown in this figure by choosing the correct set of labels

- |                |              |                 |
|----------------|--------------|-----------------|
| a. A= pharynx  | B =esophagus | C =trachea      |
| b. A= pharynx  | B =larynx    | C= bronchioles  |
| c. A = pharynx | B= trachea   | C = bronchus    |
| d. A = larynx  | B= bronchus  | C = trachea     |
| e. A = larynx  | B = bronchus | C = bronchioles |

39. (See image below)



39. This test tube has been spun with a centrifuge. The liquid portion on top labeled A is the \_\_\_\_\_ and the dark red portion on the bottom labeled C are \_\_\_\_\_

- Plasma..... erythrocytes
- Plasma..... leukocytes
- Plasma..... Platelets
- Platelets..... Erythrocytes
- Leukocytes..... Erythrocytes

40. A blood pressure reading of 150/100 is an indicator of \_\_\_\_\_ and the number 150 is the \_\_\_\_\_ blood pressure.

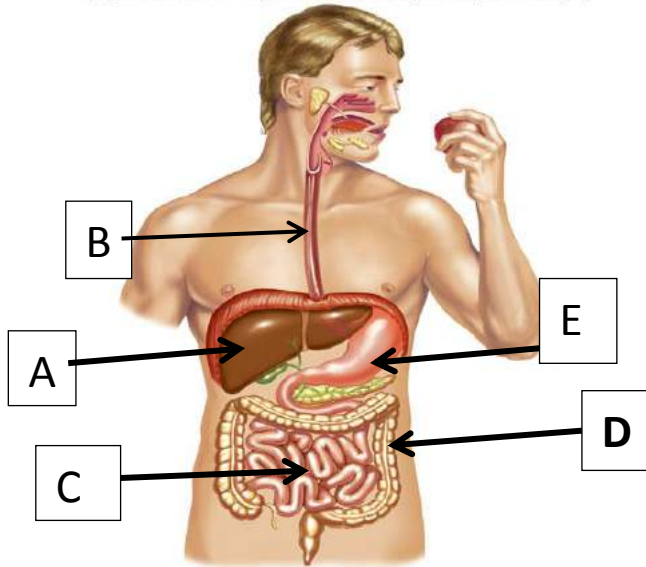
- Normal blood pressure..... systolic
- Normal blood pressure..... diastolic
- High blood pressure..... systolic
- High blood pressure.....diastolic
- Low blood pressure..... diastolic



41. What is the human body's first line of defense against pathogens?
- Macrophages and inflammation
  - Antibodies
  - Barriers of the skin with its oil and sweat, tears of eyes
  - T lymphocytes
  - B lymphocytes
42. Helper T cells \_\_\_\_\_
- Launch antibody-mediated immunity only
  - Launch cell-mediated immunity only
  - Launch both antibody-mediated and cell mediated immunity
  - Do not help launch either antibody-mediated nor cell-mediated immunity
43. Vaccinations are effective in producing immunity because they stimulate the production of \_\_\_\_\_
- Red blood cells
  - White blood cells
  - Memory cells
  - Helper T cells
  - Phagocytes
44. The disease of rheumatoid arthritis involves a person attacking their own joints resulting in inflammation and pain. Rheumatoid arthritis is a(n) \_\_\_\_\_
- Type of allergy
  - Infectious disease
  - Immune deficiency disease
  - Autoimmune disease
  - Pulmonary disease
45. The \_\_\_\_\_ sends out digestive enzymes to complete digestion and is the location where most nutrients are absorbed into the bloodstream.
- Small intestine
  - Large intestine
  - Stomach
  - Rectum
  - Esophagus
46. Which of the following is **Nota** function of the excretory (urinary) system?
- Elimination of nitrogenous wastes ( ammonia, urea, uric acid)
  - Maintenance of salt balance
  - Help in maintaining acid-base balance
  - Elimination of undigested food
  - Maintenance of water balance

47. Use key below

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47. What letter points to the organ where bile is made, ammonia is converted to urea, and glucose is converted to glycogen?

- a. A
- b. B
- c. C
- d. D
- e. E.

48. What letter points to the organ where major water absorption occurs and formation of feces?

- a. A
- b. B
- c. C
- d. D
- e. E

48. Use above key

49. Which of the following describes the route of urine out of the body after it leaves the kidney?

- a. Renal vein.....urinary bladder.....urethra.....ureter
- b. Renal vein..... ureter.....urinary bladder.....urethra
- c. Urethra.....urinary bladder.....ureter
- d. Ureter..... urinary bladder.....urethra
- e. Urethra.....urinary bladder.....ureters

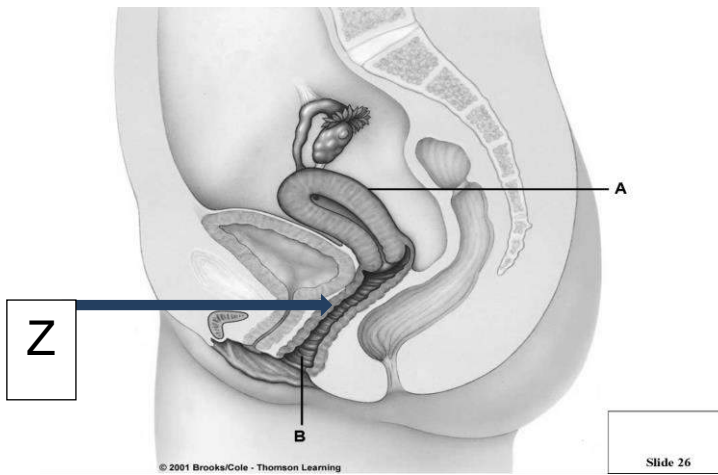
50. What is the functional unit of the kidney in which urine is formed?

- a. Nephron
- b. Alveolus
- c. Villi
- d. Ganglia
- e. Ventricle

51. Which is an **incorrect** match?

- a. Fertilization ----- union of egg and sperm to form a zygote
- b. Ovulation ----- release of an egg from a follicle
- c. Cleavage ----- repeated division of cells without increase in size
- d. Gastrulation ..... formation of a solid ball of cells
- e. Blastulation ..... formation of a hollow ball of cells

52. (see image below)



53. (see image below)



53. The path of sperm in a male from the seminiferous tubules is \_\_\_\_\_

- a. epididymis.....urethra.....vas deferens
- b. epididymis.....vas deferens..... Urethra
- c. urethra..... Vas deferens.....epididymis
- d. urethra..... Epididymis.....vas deferens
- e. vas deferens.....urethra.....epididymis

54. Which of the following is an **incorrect** match?

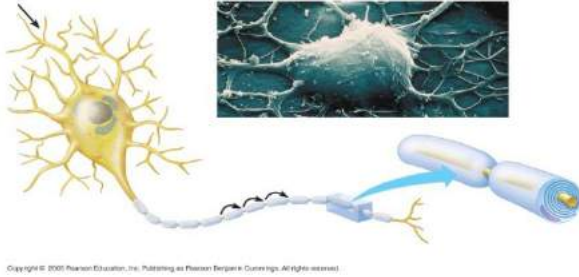
- a. Testes.....testosterone
- b. Ovaries..... Estrogen and progesterone
- c. Adrenal glands.....Epinephrine
- d. Pancreas..... Insulin and glucagon
- e. Thymus..... Thyroxine

55. The central nervous system consists of \_\_\_\_\_

- a. Cranial nerves
- b. Peripheral nerves
- c. Brain and spinal cord
- d. Only the brain
- e. Only the spinal cord

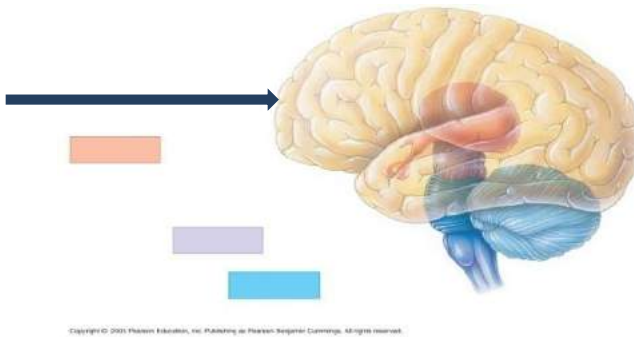
56. The dramatic change in voltage across the cell membrane of a neuron that occurs only after a threshold value is reached is called the \_\_\_\_\_.
- Threshold potential
  - Resting potential
  - Passive potential
  - Action potential
  - Reaction potential

57. (see image below)



57. The part of the neuron that sends on the electrochemical signal to another neuron and may be covered by a myelin sheath is called \_\_\_\_\_
- dendrite
  - cell body
  - axon
  - nucleus
  - neurotransmitter

58. (see image below)

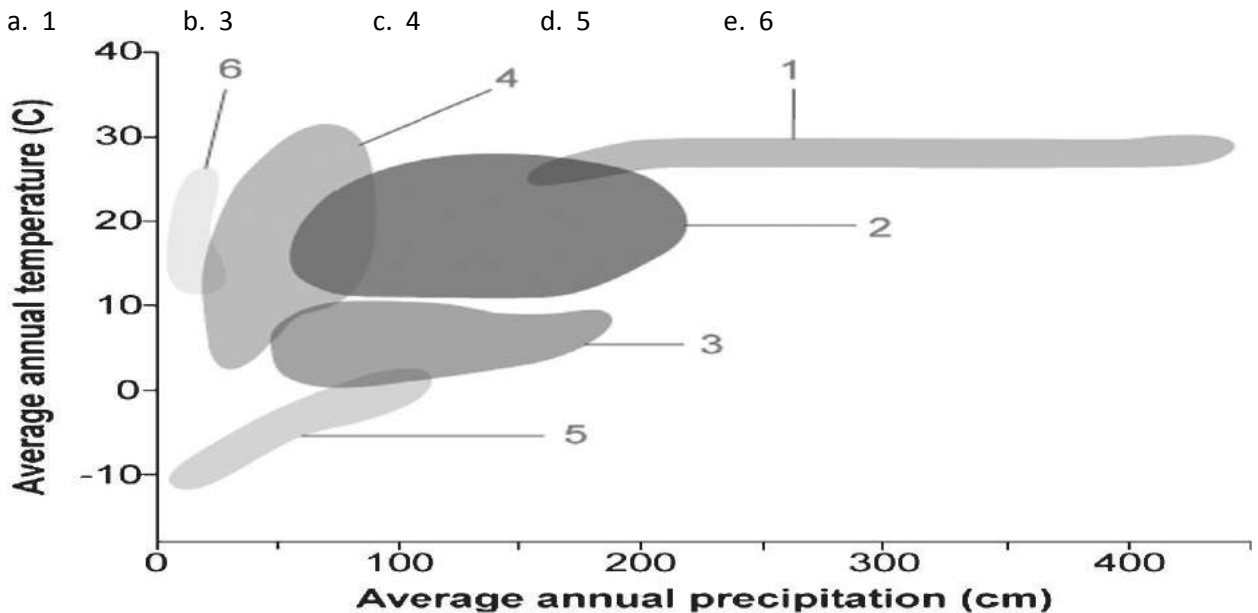


58. The arrow points to the region of the brain responsible for \_\_\_\_\_
- breathing and digesting
  - coordinating muscle movement and balance
  - thinking, remembering, sensing, and control of skeletal muscles
  - functioning of kidneys and heart

59. Which type of neuron is found in the brain and spinal cord?
- Sensory neuron
  - Interneuron
  - Motor neuron
60. Because only the \_\_\_\_\_ gland uses iodine to make its hormone thyroxine, radioactive iodine is often used as a treatment for tumors of this gland.
- Thyroid
  - Pituitary
  - Adrenal
  - Testicular
  - Pancreatic

61. The chemical signals released at the end of a pre-synaptic neuron that moves across the synaptic cleft and are received by the post-synaptic neuron are called\_\_\_\_\_
- Hormones
  - Neurotransmitters
  - Pheromones
  - Histamines
  - Cytokines
62. Where are the receptors located for a protein type hormone such as insulin?
- Inside of every cell in the body
  - Inside of the hormone's target cells
  - Within the plasma membrane of every cell in the body
  - Within the plasma membrane of the hormone's target cells
63. Which of the following does not pair a hormone with what it regulates in the human body?
- Insulin..... decreases in blood glucose level
  - Glucagon.....increases in blood glucose level
  - ADH (antidiuretic hormone)..... water conservation in kidney
  - Oxytocin.....uterine contractions during delivery of a baby
  - Parathyroid hormone..... Controls vitamin D levels

64. In the figure below, which number would designate the cold tundra biome with low average annual precipitation?



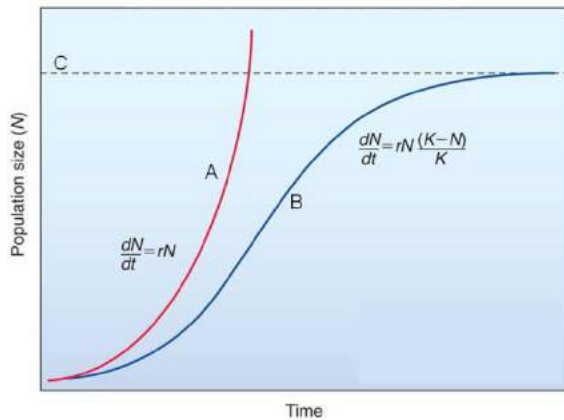
65. In the figure above, what is the range of average annual precipitation (cm) for biome #3?

- 5-100
- 50-175
- 150-450
- 0-10
- 50

66. What factors could prevent a population from growing beyond its carrying capacity?

- a. Disease
- b. Limited food
- c. Limited places to live
- d. Competition
- e. All of the above are factors

67. (see graph below)



67. Choose the best model of population growth.

- a. it fits a logistic model
- b. it takes a long time to reach carrying capacity
- c. it is described by the equation  $\frac{dN}{dt} = rN$
- d. growth rate is constant
- e. it represents exponential growth

68. Which of the following represents a **biological community**?

- a. All the black bears living in a certain area
- b. A species of shark in the Gulf of Mexico
- c. The temperature, amount of rainfall, monkeys and plants in a rainforest
- d. All of the living organisms inhabiting a New Mexico desert
- e. The number of squirrels in Central Park New York

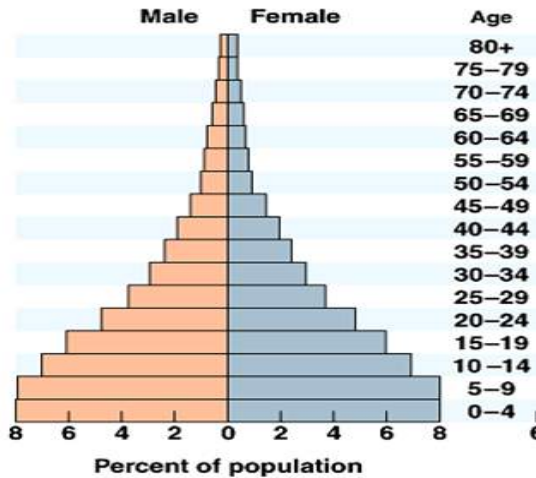
69. Which of the following lists **only** abiotic environmental factors?

- a. Temperature, fire, wind, parasites
- b. Soil minerals, oxygen levels, light, competitors
- c. Wind, temperature, soil minerals, light
- d. Light, rainfall, predators, temperature
- e. Precipitation, cloud cover, wind, symbionts

70. The process of primary succession occurs \_\_\_\_\_

- a. Around a recently erupted volcano
- b. On a newly plowed field
- c. On a hillside that has suffered a mudslide
- d. On a recently flooded riverbank
- e. On a freshly cleared subdivision lot

71.



70. What is **not** true about this population?

- a. The population will increase at a rapid pace.
- b. The pre-reproductive population is larger than the elderly population.
- c. This pattern is typical of a developed country
- d. There is a close balance in the population in terms of males and females
- e. This population will require many more resources in the future.

72. Which of these is a **density dependent factor** in terms of its effect on populations?

- a. Hurricane
- b. Competition and parasitism
- c. Earthquake
- d. Volcano
- e. Windstorm

73. Population density is the number of \_\_\_\_\_ in a given area.

- a. Adults of a single species
- b. Females of a single species
- c. Prereproductive individuals of a single species
- d. Individuals of a single species

74. In a food chain "plant to caterpillar to lizard to snake", which of these is the herbivore?

- a. Plant
- b. Caterpillar
- c. Lizard
- d. Snake
- e. None of these

75. The term for a species that is found only in a particular place or region and nowhere else ( ie kangaroo in Australia) is called a(n) \_\_\_\_\_ species

- a. Threatened
- b. Endangered
- c. Endemic
- d. Keystone
- e. Invasive