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For each question, please fill in the appropriate circle on your scantron that BEST answers the question. The questions are worth 2 points each.

**CORRECT ANSWERS ARE HIGHLIGHTED** *dehy - high - high*  
*antidiuretic - holds water*

1. You have consumed four liters of water today, and you are hydrated. Your blood ADH levels would be relatively \_\_\_\_\_ now, compared to the blood ADH levels when you are dehydrated. A) higher. **B) lower.**
2. Which general class of hormones generally binds to a receptor located on the outer cell (plasma) membrane?  
**A) protein hormones.** B) steroid hormones.
3. Which of the following glands secrete hormones that enable the body to respond to stress?  
A) pancreas. B) parathyroid glands. C) pineal gland. **D) adrenal glands.** E) thyroid.
4. Which hormone exerts an antagonistic action to insulin (i.e. it has an opposite effect)?  
A) thyroxin. B) epinephrine. C) growth hormone. **D) glucagon.** E) calcitonin.
5. The hypothalamus controls the release of hormones by the posterior pituitary by means of:  
**A) releasing hormones and inhibiting hormones.** B) secondary messengers. C) prostaglandins.  
D) antibodies. **E) neurosecretory cells in the hypothalamus itself actually produce the hormones.**
6. Thyroid stimulating hormone (TSH) is secreted by the: A) pancreas. B) hypothalamus. C) thyroid.  
D) adrenal medulla. **E) anterior pituitary.**
7. Glucagon causes an increase in blood sugar concentrations, whereas insulin causes a decrease in blood sugar.  
**A) True.** B) False.
8. Epinephrine (adrenaline) is secreted by the: A) pineal gland. B) anterior pituitary.  
C) thyroid. **D) adrenal medulla.** E) pancreas.
9. If you ingested a drug that temporarily disrupts the functioning of the thyroid gland, you would have difficulty producing which of the following?  
A) **calcitonin.** B) melatonin. C) adrenaline (epinephrine). **D) aldosterone.** E) glucagon
10. Prolactin is produced by the ~~anterior~~ <sup>posterior</sup> pituitary and it stimulates the mammary glands to begin to secrete milk.  
A) **True.** **B) False.**
11. In a human female, a primary oocyte begins meiosis. Once meiosis is finished, \_\_\_\_\_ have been produced.  
A) 4 ova. B) 3 ova and 1 polar body. C) 2 ova and 2 polar bodies. **D) 1 ovum and 2 (or 3) polar bodies.**  
E) 4 oogonia.
12. The structure or structures found in human females that produce mucus which will serve as a lubricant for intercourse: A) bladder. B) Bulbourethral glands. C) prostate. D) glans penis. **E) Bartholin's glands.**
13. Once leaving the testes, sperm are stored in and mature in the \_\_\_\_\_.  
**A) epididymis.** B) vas deferens. C) prostate. D) oviduct. E) seminiferous tubules.
14. Which of the following produces testosterone? A) sperm cells. **B) hypothalamus.** C) **Leydig (interstitial) cells.**  
D) anterior pituitary. E) seminiferous tubules.

15. High levels of estrogen causes a \_\_\_\_\_ on the gonadotropin (FSH and LH) levels, whereas later in the female menstrual cycle, estrogen and progesterone together cause a \_\_\_\_\_ on gonadotropin concentrations.  
 A) positive feedback; negative feedback.  B) negative feedback; positive feedback
16. Motor nerves send signals from \_\_\_\_\_ to \_\_\_\_\_. A) distributor; engine block. B) brain; sensory receptors.  
 C) brain; muscles. D) sensory receptors; brain. E) muscles; brain.
17. This ion is present at relatively higher concentrations outside a neuron that currently has a resting potential, compared to inside: A) carbon. B) magnesium. C) calcium.  D) sodium. E) potassium. *K<sup>+</sup> in Na<sup>+</sup> out*
18. The phenomenon where an action potential appears to jump from one node to the next in a myelinated nerve is called: A) depolarization. B) repolarization. C) refraction.  D) saltatory conduction.  
 E) sensation.
19. The resting potential of a particular nerve cell (cell A) is -70 mV (millivolts). Inputs from two other nerve cells cause the potential in cell A to become more negative inside than outside (lowered to -80 mV). This means with additional stimulation that cell A is: A) more likely to generate an action potential.  B) less likely to generate an action potential.
20. The change in the potential of cell A (in question 19) from -70 mV to -80 mV is called \_\_\_\_\_.  
 A) depolarization. B) an action potential. C) repolarization.  
 D) impossible, the potentials of cells do not change.  E) hyperpolarization.
21. If you injected acetylcholine into a person, where would acetylcholine exert its effect on a nerve cell?  
 A) in the midsection of an axon.  B) at the synapse. C) at the nucleus. D) at the endoplasmic reticulum.  
 E) at the nodes of Ranvier.
22. Which of the following is part of the cerebrum? A) pons. B) thalamus.  
 C) frontal lobe. D) hypothalamus. E) two of the above answers are part of the cerebrum.
23. Each and every action potential produced by a single cell is always of the same size (amplitude).  
 A) True. B) False.
24. The part of the brain that functions to produce emotional feelings, such as anger, fear, pleasure, pain and sorrow, is the: A) pons. B) cerebellum.  C) medulla oblongata. D) thalamus. E) limbic system.
25. The part of the autonomic nervous system that is most active under emergency conditions, is the:  
 A) parasympathetic nervous system.  B) sympathetic nervous system. C) peripheral nervous system.  
 D) central nervous system.
26. The main proteins involved in muscle contraction are: A) actin and melanin.  B) actin and myosin.  
 C) myosin and keratin. D) melanin and myosin. E) elastin and keratin.
27. A motor unit contains: A) muscle fibers only. B) nerve cell fibers only.  C) several muscle fibers and one nerve fiber.  
 D) several nerve fibers and one muscle fiber.  E) several nerve fibers and several muscle fibers.
28. The action potential in the muscle cell causes the sarcoplasmic reticulum to release:  
 A) Na<sup>+</sup>.  B) K<sup>+</sup>. C) Cl<sup>-</sup>.  D) Ca<sup>+2</sup>. E) oxygen.
29. A population that is growing exponentially can be illustrated accurately by a(n) \_\_\_\_\_ shaped curve.  
 A) S B) L C) Z D) bell  E) J

30. In a population, as  $N$  approaches  $K$ , which of the following is predicted by the logistic equation? A)  $r$  will increase. B) the change in numbers added per unit time ( $dN/dt$ ) will approach zero. C) the population will decrease exponentially. **D) the carrying capacity will increase.** E) the carrying capacity will decrease.
31. The carrying capacity is the: A) largest-sized individual that can live in the ecosystem. **B) the number of species that can be supported at any time in the habitat.** C) the highest possible population size for a species. D) the maximum sustainable number of species in an environment. E) the maximum sustainable population size for a species in an environment.
32. Certain protozoans live in termite guts. The protozoans benefit from the association by having a place to live, the termites benefit by receiving food from the activities of the protozoans. This is an example of: A) predation. B) commensalism. C) competition. **D) mutualism.** **E) parasitism.**
33. In a grassland, experimenters artificially added a species of grass (species 'X') to some plots. In those plots, five other grass species went extinct over the course of three years. Species 'X' was exerting an effect on the rest of the community by its presence or absence. That effect is called: A) resource (niche) partitioning. B) character displacement. C) keystone predation. **D) competitive exclusion.** E) sexual selection.
34. The sentence "Two species that have exactly the same requirements cannot coexist indefinitely in the same niche" refers to the: **A) competitive exclusion principle.** B) cosmopolitan species rule. C) relative abundance of all species on earth. D) keystone competition principle. E) lack of animal species on earth.
35. If TFR (total fertility rate) for humans was around 5, then the human population will \_\_\_\_\_. A) remain about the same size over time. **B) increase over time.** C) decrease over time.
36. Bacteria and fungi are referred to as decomposers because they A) consume the elements directly. B) are parasites. **C) feed on dead organic matter and convert it back into forms plants can use.** D) only eat living plants and animals. E) kill only plants.
37. In a forest, hawks feed on robins. Robins in turn feed on preying mantids and grasshoppers. The mantids feed on grasshoppers. The grasshoppers in turn feed on plants. How many trophic levels are present (what is the maximum chain length)? A) 3 B) 4 **C) 5** D) 6 E) 7 *hawks - robins - mantids - grasshoppers - plants*
38. Which of the following communities would persist the longest in isolation (i.e., without the input of materials from outside of the ecosystem)? A) herbivores and carnivores. **B) decomposers and producers.** C) carnivores and decomposers. **D) producers and herbivores.** E) producers and carnivores.
39. A person who was a vegetarian (eating green live, leafy vegetables) would be classified as a: A) primary producer. B) secondary producer. **C) primary consumer.** D) secondary consumer. E) decomposer.
40. If there is a total of 20,000 pounds of carnivore biomass in a small forest, how much plant biomass should be present, following the ten percent rule? A) 2 million pounds B) 200,000 pounds C) 20,000 pounds **D) 2,000 pounds** E) 200 pounds  
*carnivore → herbivore → plants*  
*20000      200000      2000000      2000000*
41. In an ecosystem, nutrients \_\_\_\_\_ and energy \_\_\_\_\_. A) flows, flow. **B) cycle, flows.** C) cycles, cycles. D) flows, cycles. E) are lost, are gained.  
*20,000*
42. Eutrophication of a freshwater lake results from: A) addition of N (from sewage and runoff) and the subsequent increase in plant productivity. B) toxic effects of pesticides on consumers. C) competition for N and P nutrients by producers. **D) elimination of the decomposers of the system.** E) increased light levels.

43. Which of the following is **not** an attribute of compounds that bioaccumulate and biomagnify?  A) they are unstable chemically. B) they are not easily broken down by bacterial activity, or by metabolism within animals. C) they are able to be sequestered in bone and fat. D) they are not easily excreted by the kidneys. E) all of the above statements are actually correct.
44. The increase in the amount of toxic pesticides as you go up the food chain (from plant to herbivore to carnivore) is called: A) intoxication.  B) biomagnification. C) trophic enrichment. D) bioaccumulation. E) pesticide concentration.
45. Which of the following **reduces** the carbon dioxide content of the atmosphere? A) respiration. B) forest fires. C) coal burning.  D) photosynthesis. E) all of the above add carbon dioxide to the atmosphere.
46. The nutrient cycle that has no atmospheric component is the \_\_\_\_\_ cycle.  A) phosphorus. B) nitrogen. C) carbon. D) water. E) sulfur.
47. Ozone depletion is occurring in the stratosphere in part because of the increase in chlorofluorocarbons (CFCs) in the atmosphere.  A) True. B) False.
48. Which of the following would occur if global warming occurs? ~~A) more land would be exposed as shorelines recede (the sea levels lowers).~~ ~~B) the polar ice caps and glaciers would increase in size.~~  C) the air temperature over the ocean would decrease. ~~D) fewer violent storms.~~ E) tropical species can move northward into the temperate zones.
49. If rainfall had a pH of 6.5, could this be called acid rain? A) Yes, because it is a pH of less than 7. B) No, because no rain is acidic.  C) No, because the normal pH of rain has a more acidic pH of 5.6. D) No, because acid rain by definition must be a pH of less than 1. E) No, acid rain must have a pH of 14 or higher.
50. It is estimated that 25% of the pharmaceutical drugs we use today contain active ingredients derived from wild plants, thus it is important to preserve as many wild populations as possible, because they may produce many more promising drugs in our battle with cancer, AIDS, and other diseases. This is a(n) \_\_\_\_\_ justification or reason for preserving diversity. A) intellectual B) ecological  C) aesthetic/emotive D) religious/moral E) utilitarian