普通生物學

(C)1. A population will always grow exponentially _____.
(A)if it is limited only by density-dependent factors (B)until it reaches carrying capacity
(C)if there are no limiting factors (D)if it is a population with an equilibrium life history
(E)if it shows logistic growth

(B)2. When the per capita birth rate equals the per capita death rate, _____.
(A)a population grows rapidly (B)the size of a population remains constant
(C)density-dependent limiting factors do not affect the population
(D)a population is in danger of extinction (E)a population goes through up and down cycles

(A)3. The declining-population approach _____.
(A)emphasizes the environmental factors that caused a population's decline
(B)emphasizes smallness itself as an ultimate cause of a population's extinction
(C)emphasizes the impact of the loss of genetic diversity in a population
(D)was used to help increase the population size of prairie chickens in Illinois
(E)all of the above

(A)4. What is the effective population size of a population containing 1,200 individuals when females breed with 500 males?
(A)1,000 or 83.3% (B)1,000 or 100% (C)250 or 20.8% (D)1,200 or 100% (E)none of the above

(D)5. Kingfish, Louisiana, had a population of 1,100 individuals. They had a birth rate of 12/100, a death rate of 8/100, and an emigration (individuals leaving the population) rate of 2/100. How many people were added to Kingfish's population in one year?
(A)2 (B)6 (C)20 (D)22 (E)1,122

(E)6. Altruistic behaviors can be understood, in part, by considering the coefficient of relatedness (*r*) between the individuals involved. Assume that an individual mammal has the option to raise its own offspring, other genetic relatives, or a combination of offspring and other genetic relatives.
(A) two offspring (B) two offspring and two first cousins (C) four grandchildren
(D) one sibling and three nephews (E) seven first cousins

(B)7. A kinesis differs from a taxis in that a kinesis is _____ whereas a taxis is _____.
(A)innate …learned (B)a change in activity … a directional response to stimulus
(C)a response to chemicals … a response to light (D)proximate … ultimate
(E)stimulus dependent … stimulus independent

(B)8. Paralogous genes _____.
(A)are passed from generation to generation in a straight line
(B)result from gene duplication
(C)can only diverge after speciation has taken place
(D)are responsible for the differences in beta hemoglobin in humans and mice
(E)cannot diverge in the same gene pool

(D)9. What are the three levels of biodiversity ?
(A)genetic, species, biome (B)molecular, species, biome (C)genetic, population, ecosystem
(D)genetic, species, ecosystem (E)molecular, species, ecosystem

(D)10. Which example below is **not** proposed by the green world hypothesis as a factor that keeps herbivores in check?
(A)Plants have defenses against herbivores.
(B)Intraspecific competition can limit herbivore numbers.
(C)Abiotic factors limit herbivores.
(D)Energy supply, not nutrients, usually limits herbivores.
(E)Interspecific interactions check herbivore densities.

(A)11. Species A and Species B are in the same phylum. Species A and Species C, but not Species B, are in the same order. From this information you can conclude that _____.
(A)Species C could be in the same class as Species A and B
(B)Species A and Species B are in the same family
(C)Species B and Species C share a less recent ancestor than do Species A and B
(D)all three species are members of the same genus
(E)all three species are not members of the same phylum

(E)12. The _____ suggests that differential speciation plays a role in _____ similar to the role of differential reproduction in _____.
(A)theory of "evo-devo" … macroevolution … microevolution
(B)theory of adaptive radiation … microevolution … macroevolution
(C)species selection model … microevolution … macroevolution
(D)theory of "evo-devo"… microevolution … macroevolution
(E)species selection model … macroevolution … microevolution

(C)13. In the transition from each trophic level of the food chain to the next trophic level, there is about a(n) _____.
(A)80% gain of energy (B)2% gain of energy (C)80% loss of energy
(D)2% loss of energy (E)5% loss of energy

(C)14. Which theory below suggests that reducing or increasing the abundance of one species in a community affects many other species?
(A)integrated hypothesis (B)individualistic hypothesis (C)rivet model (D)redundancy model
(E)none of the above

(B)15. Assume a population in Hardy-Weinberg equilibrium for a character trait with these genotypic frequencies : $AA = 0.25$, $Aa = 0.50$, and $aa = 0.25$. If you remove all the homozygous dominants and allow the remaining population to reproduce (again under Hardy-Weinberg conditions), what will be the frequency of homozygous dominants in the next generation?
(A)0 (B)0.11 (C)0.22 (D)0.44 (E)0.50

(E)16. Which one of the following is **not** a requirement for, nor a feature of, natural selection?
(A)excess numbers of individuals (B)variation in individuals (C)heritable traits
(D)greater numbers of offspring from the better adapted
(E)environmentally induced acquisition of traits

(B)17. In natural selection, _____ determines which phenotypes are successful.
(A)chance (B)the environment (C)sample size (D)genetic drift (E)human intervention

(D)18. What is the key difference between a dominant species and a keystone species?
(A)There is no difference. The two terms are synonymous.
(B)Dominant species alter the structure or dynamics of the environment; keystone species are the most abundant.
(C)Dominant species are the most abundant; keystone species exert control through important roles or niches.
(D)The removal of a dominant species from a community has more impact than removing a keystone species.
(E)Keystone species are more successful at evading their predators and the impacts of disease.

(B)19. Which sentence below summarizes the Allee effect?
(A)New individuals are added to the population most rapidly at intermediate population size.
(B)Individuals have a more difficult time surviving or reproducing if the population size is too small.
(C)Population adjust instantaneously and approach carrying capacity smoothly.
(D)Different populations of the same species may show a balance of *K*-selected and *r*-selected traits.
(E)None of the above.

(A)20. To calculate the _____ of a nation, researchers summarize arable land, pasture, fossil energy land, and several other factors appropriated by each nation to produce all of the resources it consumes and to absorb all the waste it generates
(A)ecological footprint (B)carrying capacity (C)ecological capacity
(D)principles of energy flow (E)life history

(D)21. A particular environmental change causes the deaths of 25 individuals in a herd of 100 wild horses, and it kills 50 individuals in a herd of 200 horses. In this case, the growth of a wild horse population is most likely limited by _____.
(A)a density-dependent factor (B)food supply (C)a predator (D)a density-independent factor
(E)the presence of another species that uses the same food resource

(C)22. How did the addition of a gene for citrate synthesis increase the tolerance of tobacco and papaya plants to high aluminum concentrations in the soil?
(A)The citric acid produced by the plant dissolved the aluminum in the soil.
(B)The citric acid produced by the plant coated the root tips and blocked the entrance of aluminum.
(C)The citric acid produced by the plants bound the free aluminum in the soil, making it less available to be taken up by the plants.
(D)The citrate synthase gene activated the *Sub1A-1* gene and improved aluminum tolerance in the plants.
(E)all of the above

(A)23. Which example below is a role of nitric oxide (NO), a local regulator?
(A)When oxygen levels fall, nitric oxide activates an enzyme that relaxes smooth muscle. This dilates blood vessels and improves blood flow.
(B)When secreted by certain white blood cells, NO stimulates the reproduction of some bacteria and cancer cells.
(C)NO decreases the blood flow into the penis, producing an erection.
(D)In the nervous system, NO serves as a cell surface receptor.
(E)all of the above

(C)24. At a particular position along a nephron, the osmotic potential of the filtrate is 500 mosm/L while the surrounding kidney's is 600 mosm/L. Which one of the following is a likely result?
(A)Water will diffuse into the nephron by osmosis.
(B)Water will be pumped into the nephron by active transport.
(C)Water will diffuse out of the nephron by osmosis.
(D)Water will be pumped out of the nephron by active transport.
(E)There will be no net movement of water.

(E)25. HIV is a dangerous pathogen because _____.
(A)it mutates at a very high rate. (B)the virus evolves within the body.
(C)the virus prevents recognition and elimination by the immune system.
(D)it leads to the loss of T cells. (E)all of the above

(C)26. Why do larger animals, like a bullfrog, require a circulatory system, but animals such as a planarian do not?
(A)Each cell in a bullfrog requires more oxygen and nutrients than each cell in a planarian.
(B)The cells of a bullfrog are many times larger than the cells of planarian.
(C)Diffusion is inadequate to move gases through the surface and into all parts of a larger animal body. However, diffusion alone is sufficient to move gases in and out of the thin body of a planarian.
(D)Gases do not diffuse through bone. Therefore, any animal with bones, such as a bullfrog, has to have a circulatory system. Any animal without bones, such as a planarian, does not have a circulatory system.
(E)none of the above

(B)27. An insufficient supply of chemical energy in the diet results in _____ while a shortage of one or more essential nutrients results in _____.
(A)malnourishment; undernourishment (B)undernourishment; malnourishment
(C)mesonourishment; ectonourishment (D)hypernourishment; hyponourishment
(E)hyponourishment; hypernourishment

(E)28. When sugar is transported in plants, _____.
(A)sugar always moves upwards from roots to leaves
(B)leaves are always sugar sources and roots are always sugar sinks
(C)leaves are always sugar sinks and roots are always sugar resources
(D)leaves may be sinks or sources, but roots are always sinks
(E)none of the above

(B)29. Mycorrhizae enhance plant nutrition mainly by
(A)absorbing water and minerals through the fungal hyphae.
(B)providing sugar to the root cells, which have no chloroplasts of their own.
(C)converting atmospheric nitrogen to ammonia.
(D)enabling the roots to parasitize neighboring plants.
(E)stimulating the development of root hairs.

(C)30. You are interested in determining what part of a plant is actually sensitive to light for phototropism. A good first experiment would be to _____.
(A)remove the apical meristem and apply auxin before beginning light treatments
(B)shine light from one side only. Then measure the auxin diffusing down the stem on the light and the shaded sides
(C)cover one part (for instance, the tip or base) before beginning light treatments
(D)spray auxin on just one part of the plant at a time to determine which one stimulates flowering
(E)try light treatments of different colors (first blue, then yellow, then green) to see which promotes flowering the fastest

(A)31. The triple response to mechanical stress results in _____.
(A)decreased stem elongation (B)thinner, weaker stems (C)symmetric growth
(D)the activation of kinase (E)is promoted by ctytokinin

(C)32. During winter, tree sap can sometimes freeze and *cavitation* (the formation of an air pocket) may occur. Which one of the following mechanisms of sap transport would you expect to be most immediately affected by cavitation?
(A)symplast function (B)pressure flow (mass flow) (C)cohesion transpiration (D)root pressure
(E)active transport

(B)33. In an environment that is very stable, with reliable moisture and temperature, what type of reproduction would be most advantageous for a plant and why?
(A)Sexual reproduction because it is always better to increase genetic variation.
(B)Asexual reproduction because it ensures that the genes that have proven to adapt the plant well to the environment will be passed on to the next generation.
(C)Sexual reproduction because it will ensure that the most advantageous genes are passed on to the next generation.
(D)Asexual reproduction because it increases the genetic variation with in the population.
(E)Sexual reproduction because it requires less energy.

(C)34. A botanist had an apple tree in his yard that produced eight different varieties of apple.
(A)repeated selection of seedlings with desirable qualities
(B)inducing mutations in the young seedling
(C)grafting scions of different varieties onto the same root stock
(D)protoplast fusion of different varieties in the same culture tube
(E)none of the above

(C)35.Which is true regarding mineral deficiency symptoms in plants?
(A)Deficiency symptoms of freely moving nutrients will show up first in younger organs.
(B)Deficiency symptoms of immobile nutrients will show up first in order organs.
(C)Growing tissues would not show signs of mineral deficiency of mobile nutrients before older tissues.
(D)Symptoms of mineral deficiency always show up in older leaves first.
(E)Symptoms always show up in younger leaves first.

(D)36.Which of the following is least likely to be deficient in soil?
(A)oxygen (B)phosphorus (C)carbon (D)iron (E)hydrogen

(C)37.In this type of asexual reproduction, seeds are produced even without the joining of sperm and eggs.
(A)callus (B)fragmentation (C)apomixis (D)cloning (E)grafting

(A)38.What is the underlying feature that allows plants to reproduce asexually?
(A)They have two types of undifferentiated, dividing cells, parenchyma cells and meristems.
(B)They don't require a pollinator. (C)They can form adventitious roots.
(D)They can form adventitious shoots. (E)They don't require genetic recombination.

(E)39.Growth that results in curvatures of whole plant organs toward or away from stimuli is called _____.
(A)gravitropism (B)phototropism (C)thigmotropism (D)heliotropism (E)all of the above

(C)40.A conformational change in a substance called phytochrome _____.
(A)causes a plant to bend toward light (B)triggers fruit drop (C)leads to de-etoliation
(D)is responsible for gravitropism
(E)causes changes in a plant response to stresses such as water shortage

(D)41.When referring to phloem transport, the "sink" in roots is created by _____.
(A)the active transport of mineral ions into xylem cells
(B)the osmosis of water into xylem cells
(C)the absorption of water from the soil through epidermal cells
(D)the active transport of sugars from phloem to cortex cells
(E)all of the above

(C)42.An open circulatory system _____.
(A)is less common in crabs and beetles than in mice and snakes
(B)does not rely on muscle contraction
(C)allows interstitial fluid to mix freely with vascular fluid
(D)restricts the backflow of blood by valves in the trachea
(E)has no valves

(C)43.Which one of the following hormones or types of hormones is though to act the cellular level by inducing a change in gene expression?
(A)protein hormones (B)thyroid-stimulating hormone (TSH) (C)sex hormones (D)catecholamines (E)antidiuretic hormone

(B)44.What supplies the energy for most of the microorganisms in the rhizosphere?
(A)nitrogen-fixing bacteria (B)plants (C)mycorrhizae (D)earthworms (E)soil bacteria

(C)45.The most abundant gas in our atmosphere cannot be used by plants directly in its atmospheric form and is, therefore, captured by certain bacteria that live symbiotically in their roots. What is this gas?
(A)hydrogen (B)carbon dioxide (C)nitrogen (D)oxygen (E)neon

(E)46.Which one of the following would most likely be an example of a density-independent factor limiting population growth?
(A)food availability (B)diseases (C)accumulation of toxic wastes (D)parasites
(E)daily temperature extremes

(A)47.An ecologist would suspect a population to be growing rapidly if it _____.
(A)constains many more prereproductive than reproductive individuals
(B)is near its carrying capacity (C)is limited only by density-dependent factors
(D)show a clumped pattern of dispersion (E)is far below its carrying capacity

(B)48.If you wanted to determine what percentage of the population of Thailand is less than 10 years old, you could look at _____.
(A)a logistic curve for the population (B)the population's age structure
(C)a life table for the population (D)a plot of population density
(E)the population's survivorship curve

(C)49.A population that is growing logistically _____.
(A)grows fastest when density is lowest
(B)has a high *r*
(C)grows fastest at an intermediate population density
(D)grows fastest at it approaches carrying capacity
(E)is always slowed by density-independent factors

(A)50.A population that grows rapidly at first and then levels off at carrying capacity can be modeled _____.
(A)by a logistic equation (B)as $dN/dt = b-d$ (C)as an opportunistic species (D)as $dN/dt = rN$
(E)as being relatively unaffected by limiting factors

(B)51.Which of the following is reflective of the phrase "the whole is greater than the sum of its parts"?
(A)the cell theory (B)emergent properties (C)homeostasis (D)reductionism (E)evolution

(C)52.Which of these is a deduction?
(A)My car won't start. (B)My car's battery is dead.
(C)If I turn the key in the ignition while stepping on the gas pedal, then my car will start.
(D)I lost my car key. (E)My car is out of gas.

(C)53.According to the small-population approach, what would be the best strategy for saving a population that is in an extinction vortex?
(A)determining the minimum viable population size by taking into account the effective population size
(B)establishing a nature reserve to protect its habitat
(C)introducing individuals from other populations to increase genetic variation
(D)determining and remedying the cause of its decline
(E)reducing the population size of its predators and competitors

(D)54.When levels of CO_2 are experimentally increased, C_3 plants generally respond with a greater increase in productivity than C_3 plants. This is because
(A)C_3 plants are more efficient in their use of CO_2.
(B)C_3 plants are able to obtain the same amount of CO_2 by keeping their stomata open for shorter periods of time.
(C)C_4 plants don't use CO_2 as their source of carbon.
(D)the rate of photosynthesis is limited more by CO_2 in C_3 plants than in C_4 plants.
(E)both B and D are correct.

(A)55.Paracrine signaling
(A)involves secreting cells acting on nearby target cells by discharging a local regulator into the extracellular fluid.
(B)requires nerve cells to release a neurotransmitter into synapse.
(C)occurs only in paracrine yeast cells.
(D)has been found in plants but not animals.
(E)involves mating factors attaching to target cells and causing production of new paracrine cells.

(B)56.Referring to a plant sexual life cycle, which of the following terms describes the process that leads directly to the formation of gametes?
(A)sporophyte meiosis (B)gametophyte mitosis (C)gametophyte meiosis (D)sporophyte mitosis

(C)57.Huntington's disease is caused by a dominant allele. If one of your parents has the disease, what is the probability that you, too, will have the disease?
(A)l (B)3/4 (C)1/2 (D)l/4 (E)0

(D)58.There is good evidence for linkage when
(A)two genes occur together in the same gamete.
(B)a gene is associated with a specific phenotype.
(C)two genes work together to control a specific characteristic.
(D)genes do not segregate independently during meiosis.
(E)two characteristics are caused by a single gene.

(C)59.All of the following were determined directly from X-ray diffraction photographs of crystallized DNA except
(A)the diameter of the double helix. (B)the helical shape of DNA. (C)the sequence of nucleotides.
(D)the linear distance required for one full turn of the double helix. (E)the width of the helix.

(C)60.The enzyme polynucleotide phosphorylase randomly assembles a polymer of nucleotides. You add polynucleotide phosphorylase to a solution of adenosine triphosphate and guanosine triphosphate. The resulting artificial mRNA molecule would have _____ possible different codons if the code involved two-base sequences and _____ possible different codons if the code involved three-base sequences.
(A)2;3 (B)2;4 (C)4; 8 (D)4;16 (E)16; 64

(C)61.A researcher lyses a cell that contains nucleic acid molecules and capsid units of tobacco mosaic virus (TMV). The cell contents are left in a covered test tube overnight. The next day this mixture is sprayed on tobacco plants. Which of the following would be expected to occur?
(A)The plants would develop some but not all of the symptoms of the TMV infection.
(B)The plants would develop symptoms typically produced by viroids.
(C)The plants would develop the typical symptoms of TMV infection.
(D)The plants would not show any disease symptoms.
(E)The plants would become infected, but the sap from these plants would be unable to infect other plants.

(A)62.The numerous copies of rRNA genes in a salamander are an example of
(A)eukaryotic multigene families. (B)prokaryotic multigene families.
(C)a highly repetitive sequence. (D)enhanced promoter regions. (E)satellite DNA.

(B)63.What two enzymes are needed to produce recombinant DNA?
(A)endonuclease, transcriptase (B)restriction enzyme, ligase (C)polymerase, ligase
(D)transcriptase, ligase (E)DNA polymerase, topoisomerase

(A)64.The cloning of a plant from somatic cells is consistent with the view that
(A)differentiated cells retain all the genes of the zygote.
(B)genes are lost during differentiation.
(C)the differentiated state is normally very unstable.
(D)differentiated cells contain masked mRNA.
(E)cells can be easily reprogrammed to differentiate and develop into another kind of cell.

(B)65.Catastrophism was Cuvier's attempt to explain
(A)evolution. (B)the fossil record. (C)uniformitarianism. (D)the origin of new species.
(E)natural selection.

(A)66.What is the most important missing evidence or observation in Darwin's theory of 1859?
(A)the source of genetic variation
(B)evidence of the overproduction of offspring
(C)evidence that some organisms became extinct
(D)observation that variation is common in populations
(E)observation that competition exists in populations

(C)67.Which of the following applies to both anagenesis and cladogenesis?
(A)branching (B)increased diversity (C)speciation (D)more species (E)adaptive radiation

(A)68.Which combination of the following species characteristics would cause the greatest likelihood of fossilization in sedimentary rock?

Ⅰ. Aquatic

Ⅱ. tropical

Ⅲ. hard body parts

Ⅳ. presence of organic material

Ⅴ. flight

Ⅵ. long duration as a species

(A)Ⅰ,Ⅲ, and Ⅵ (B)Ⅰ,Ⅱ, and Ⅵ (C)Ⅲonly (D)Ⅱ and Ⅵ (E)Ⅱ,Ⅳ, and Ⅴ

(B)69.What is the strongest evidence that protobionts may have formed spontaneously?
(A)The discovery of ribozymes, showing that prebiotic RNA molecules may have been autocatalytic.
(B)The relative ease with which liposomes can be synthesized in laboratories.
(C)The fossil record found in the stromatolites.
(D)The abiotic synthesis of polymers.
(E)The production of organic compounds within a laboratory apparatus simulating conditions on early Earth.

(B)70.Which is the least accurate statement about the evolution of prokaryotes and the changing environment of Earth?
(A)Prokaryotes have interacted with the environment for more than 3.5 billion years.
(B)Although prokaryotes have a diverse morphology, they basically have the same metabolic pathways and products.
(C)Oxygen-producing photosynthesis favored the evolution of cells capable of performing aerobic respiration.
(D)Cyanobacteria evolved before aerobically respiring bacteria.
(E)Bacteria are among several kinds of organisms that recycle chemical elements in ecosystems.

(E)71.None of the following terms continue to have taxonomic significance except
(A)alga. (B)protist. (C)protozoan. (D)moneran. (E)Euglenozoa.

(C)72.Bryophytes have all of the following characteristics except
(A)multicellularity. (B)specialized cells and tissues. (C)lignified vascular tissue.
(D)a protected, stationary egg cell. (E)a reduced, dependent sporophyte.

(B)73.Assume that a botanist was visiting a tropical region for the purpose of discovering plants with medicinal properties. All of the following might be ways of identifying potentially useful plants except
(A)observing which plants sick animals seek out.
(B)observing which plants are the most used food plants.
(C)observing which plants animals do not eat.
(D)collecting plants and subjecting them to chemical analysis.
(E)asking local people which plants they use as medicine.

(D)74.Which of the following do all fungi have in common?
(A)meiosis in basidia (B)coenocytic hyphae (C)sexual life cycle (D)absorption of nutrients
(E)symbioses with algae

(C)75.Which of the following is an important distinction between a coelomate animal and a pseudocoelomate animal? Coelomates
(A)have a body cavity, whereas pseudocoelomates have a solid body.
(B)contain tissues derived from mesoderm, whereas pseudocoelomates have no such tissue.
(C)have a body cavity completely lined by mesodermal tissue, whereas a pseudocoelomate's body cavity does not.
(D)have a complete digestive system with mouth and anus, whereas pseudocoelomates have a digestive

tract with only one opening.

(E)have a gut that lacks suspension within the body cavity, whereas pseudocoelomates have mesenteries that hold the digestive system in place.

(C)76.Corals are most closely related to which group?
(A)jellies (B)freshwater hydras (C)sea anemones (D)sponges (E)comb jellies

(E)77.Which of the following is not a shared characteristic of all chordates?
(A)pharyngeal slits (B)post-anal tail (C)notochord (D)dorsal, hollow nerve cord
(E)four-chambered heart

(C)78.A friend has discovered a new plant and brings it to you to classify. The plant has the following characteristics: a fibrous root system; no petioles; parallel leaf veins; thick, lignified cell walls; and a vascular cambium. Which of the following best describes the new plant?
(A)herbaceous dicot (B)woody dicot (C)woody monocot (D)herbaceous monocot
(E)woody annual

(B)79.Which of the following is true concerning the water potential of a plant cell?
(A)It is higher than that of air. (B)It is equal to zero when the cell is in pure water and is turgid.
(C)It is equal to 0.23 MPa. (D)It becomes higher when K+ ions are actively moved into the cell.
(E)It becomes lower after the uptake of water by osmosis.

(C)80.There are several properties of a soil in which typical plants would grow well. Of the following, which would be the least conducive to plant growth?
(A)abundant humus (B)numerous soil organisms (C)high clay content (D)high porosity
(E)high cation exchange capacity

(A)81.Which of the following is the correct sequence during alternation of generations in a flowering plant?
(A)sporophyte-meiosis-gametophyte-gametes-fertilization-diploid zygote
(B)sporophyte-mitosis-gametophyte- meiosis-sporophyte
(C)haploid gametophyte-gametes- meiosis-fertilization-diploid porophyte
(D)sporophyte-spores-meiosis- gametophyte-gametes
(E)haploid sporophyte-spores- fertilization-diploid gametophyte

(A)82.Evidence for phototropism due to the asymmetric distribution of auxin moving down the stem
(A)has not been found in eudicots such as sunflower and radish.
(B)has been found in all monocots and most eudicots.
(C)has been shown to involve only IAA stimulation of cell elongation on the dark side of the stem.
(D)can be demonstrated with unilateral red light, but not blue light.
(E)is now thought by most plant scientists not to involve the shoot tip.

(B)83.In herbivores, the observation that "form fits function" is best characterized by
(A)canine teeth for cutting grasses and leaves.
(B)an intestinal tract with a long cecum for digesting plant material.
(C)a shorter small intestine than carnivores.
(D)a small-diameter large intestine that slows peristalsis.
(E)both A and B are correct.

(C)84.Some nutrients are considered "essential" in the diets of certain animals because
(A)only those animals use the nutrients. (B)they are subunits of important polymers.
(C)they cannot be manufactured by the organism. (D)they are necessary coenzymes.
(E)only some foods contain them.

(A)85.Tapeworms are in class Cestoda, which is one type of flatworm. The tapeworm lacks a gastrovascular cavity and a circulatory system, yet it manages to survive very well in the host's intestinal tract. Which response best applies?
(A)The diffusion of nutrients is not a limiting factor to survival.
(B)Parasites do not need a gastrovascular cavity.
(C)Peristaltic movements in the host's intestinal tract replace the need for a gastrovascular cavity in the worm.
(D)Peristaltic movements in the host's intestinal tract replace the need for a circulatory system in the worm.
(E)Since the nutrients are being predigested by enzymes present in the host's intestinal tract, there is no need for a gastrovascular cavity.

(D)86.In which animal does blood flow from the pulmocutaneous circulation to the heart before circulating through the rest of the body?
(A)annelid (B)mollusk (C)fish (D)frog (E)insect

(E)87.Physical barriers to invasion by other organisms
(A)include the skin and the mucous membranes.
(B)are difficult for bacteria and viruses to penetrate.
(C)may work in conjunction with secretions like tears, perspiration, and mucus.
(D)Only A and C are correct.
(E)A, B, and C are correct.

(D)88.An alarm substance that triggers an inflammatory reaction is
(A)thyroxine. (B)adrenaline. (C)immunoglobulin. (D)histamine. (E)pyrogen.

(B)89.A marine sea star was mistakenly placed in freshwater and it died. What is the most likely explanation for its death?
(A)The sea star was stressed and needed more time to adapt to new conditions.
(B)The sea star is hypertonic to the freshwater, and it could not osmoregulate.
(C)The osmoregulatory system of the sea star could not handle the change in ionic content presented by the freshwater.
(D)The contractile vacuoles used to regulate water content ruptured in the freshwater.
(E)The water was not a factor; the sea star simply died.

(D)90.All of the following statements about hormones are correct except:
(A)They are produced by endocrine glands.
(B)They are modified amino adds, peptides, or steroid molecules.
(C)They are carried by the circulatory system.
(D)They are used to communicate between different organisms.
(E)They elicit specific biological responses from target cells.

(E)91.Asexual reproduction in animals might involve
(A)fission and budding. (B)fragmentation and gemmule production. (C)regeneration.
(D)A and B only. (E)A, B, and C.

(C)92.Which of the following is a function of the contents of the acrosome during fertilization?
(A)to block polyspermy (B)to help propel the sperm
(C)to digest the exterior coats of the egg (D)to nourish the mitochondria of the sperm
(E)to trigger the completion of meiosis by the sperm cell

(C)93.An organism that lacks integration centers
(A)cannot receive stimuli. (B)will not have a nervous system.
(C)will not be able to interpret stimuli. (D)can be expected to lack myelinated neurons.
(E)Both A and D are correct.

(B)94.Which of the following is a sensation and not a perception?
(A)the color blue as interpreted by the brain
(B)the nerve impulse caused by light hitting the back of the eye
(C)the smell of chocolate chip cookies baking
(D)the unique taste of broccoli with cheese
(E)the sound of a train passing through the city

(B)95.Compound eyes are very good for detecting motion because
(A)they have multiple neurons.
(B)they have multiple facets.
(C)they are in a group referred to as the single-lens type of eyes.
(D)visual information is decoded by more than one region of the brain.
(E)they provide binocular vision.

(B)96.All of the following would have a direct effect on the amount of precipitation in an area except
(A)air circulation cells. (B)continental drift. (C)ocean currents. (D)mountain ranges.
(E)evaporation from vegetation.

(C)97.Which of the following is a proximate cause of this behavior of increased urination?
(A)It announces to the males that she is in heat.
(B)Female cats that did this in the past attracted more males.
(C)It is a result of hormonal changes associated with her reproductive cycle.
(D)The female cat saw other cats doing it, and it worked for them.
(E)In the past, when she did it, more males were attracted.

(B)98.The pattern of dispersion for a certain species of kelp is clumped. The pattern of dispersion for a certain spedes of snail that lives only on this kelp would likely be
(A)absolute. (B)clumped. (C)demographic. (D)random. (E)uniform.

(C)99.下列何者最符合 F.E. Clements's 的交互作用假說 (interactive hypothsis)
(A)種的分布與其他種是不相關的 (B)群落缺乏明確的邊界.
(C)群落是一個功能性的集合單位 (D)植物種的組成似乎是在連續區有改變
(E)群落是種的機率合成

(E)100.Trophic efficiency is
(A)the ratio of net secondary production to assimilation of primary production.
(B)the percentage of production transferred from one trophic level to the next.
(C)the ratio of net production at one trophic level to the net production at the level below, expressed as a percent.
(D)usually greater than production efficiencies.
(E)both B and C.