選擇題，共 120 題（每題 5/6 分）

1. Carbon atoms can exist as one of three isotopes, called ^{12}C, ^{13}C, and ^{14}C. What is the difference between these isotopes?
(A) different numbers of protons. (B) different numbers of electrons. (C) different numbers of covalent bonds. (D) different numbers of neutrons. (E) different numbers of hydrogen bonds.

2. Many important classes of biological molecules are assembled by _____ and broken down by _____ allowing cells to synthesize materials when they are needed and recycle them when they are no longer required.
(A) hydrolysis; dehydration reaction. (B) ionic bond formation; hydrolysis. (C) dehydration reactions; hydrolysis. (D) hydrolysis; enzymes. (E) none

3. A molecule with a polar "head" and two nonpolar "tails" is likely to be
(A) an enzyme. (B) a protein. (C) a steroid. (D) a phospholipids. (E) a triglyceride.

4. The protein known as lysozyme (found in your tears) consists of 129 amino acids: lysine-valine-phenylalanine-glycine-cysteine-arginine-leucine. This is an example of
(A) primary structure. (B) secondary structure. (C) tertiary structure. (D) quaternary structure. (E) none

5. Which of the following statements about homeostasis is true?
(A) The internal environment is maintained absolutely constant. (B) Negative feedback loops correct deviations from normal. (C) Homeostasis is maintained by simply switching effectors on or off. (D) Positive feedback loops are good for homeostasis. (E) Set points cannot be changed.

6. All of the following statements are true about brown fat (specialized adipose tissue) EXCEPT:
(A) It has numerous mitochondria and a rich blood supply. (B) It produces heat without producing ATP. (C) It is abundantly found in newborn mammals. (D) It is important for heat production in adult humans. (E) It is abundantly found in hibernating mammals.

7. Growth hormone (GH)
(A) promotes protein synthesis and mobilizes lipids. (B) stimulates bone and skeletal muscle development and growth. (C) stimulates osteoblasts to promote bone development and growth. (D) all (E) none

8. Prolactin (PR) targets the
(A) breasts. (B) ovaries. (C) ovaries and uterus. (D) breasts and ovaries. (E) uterus.

9. Oxytocin (OT) stimulates
(A) relaxation of fibrocartilage of pubic symphysis. (B) progesterone release by the corpus luteum. (C) uterine contractions and ovarian estrogen production. (D) uterine contractions

and milk ejection (let-down). (E) none

10. Antidiuretic hormone (ADH) targets the
(A) oral mucosa. (B) kidneys. (C) hypothalmic thirst center. (D) urinary bladder. (E) none

11. Which term most precisely describes the general process of breaking down large molecules into smaller ones?
(A) catalysis (B) metabolism (C) anabolism (D) dehydration (E) catabolism.

12. Which of these statements regarding enzymes is *false*?
(A) Enzymes are proteins that function as catalysts. (B) Enzymes display specificity for certain molecules to which they attach (C) Enzymes provide activation energy for the reactions they catalyze. (D) The activity of enzymes can be regulated by factors in their immediate environment. (E) An enzyme may be used many times over for a specific reaction.

13. In animal cells,hydrolytic enzymes are packaged to prevent general destruction f cellular components.Which of the following organelles functions in this compartmentalization?
(A) chloroplast (B) lysosome (C) central vacuole (D) peroxisome (E) glyoxysome.

14. Which of the following intercellular junctions are common in epithelial tissue?
(A) tight junctions (B) desmosomes (C) gap junctions (D) both A and B (E) A,B and C.

15. One of the functions of cholesterol in animal cell membranes is to
(A) facilitate transport of ions. (B) store energy. (C) maintain membrane fluidity. (D) speed diffusion (E) phosphorylated ADP.

16. Of the following ,which is the most important role of exocytosis?
(A) to move away from danger (B) to release substances from the cell (C) to incorporate nutrients (D) to pump protons (E) to create new cells

17. Cellular respiration harvests the most chemical energy from which process?
(A) substrate-level phosphorylation (B) forming lactate form pyruvate (C) converting oxygen to ATP (D) transferring electrons from organic molecules to oxygen (E) generation carbon dioxide and oxygen in the electron transport chain

18. How many carbon atoms feed into the Krebs cycle?
(A) 2 (B) 4 (C) 6 (D) 8 (E) 10

19. Ligand-gated ion channels
(A) are important in the nervous system. (B) lead to changes in sodium and calcium concentrations in cells. (C) open or close in response to a chemical signal. (D) involve A and B. (E) involved A, B and C

20. Which of the following is *not* considered a secondary messenger?
(A) cAMP (B) GTP (C) calcium ions (D) diacylglycerol (E) inositol triphosphate

21. The early suggestion that the oxygen (O_2)liberated from plants during photosynthesis comes from water was
(A) first published by Melvin Calvin, who also discovered the Calvin cycle. (B) confirmed by experiments using oxygen-18(^{18}O). (C) made following the discovery of photorespiration because of rubisco's sensitivity to oxygen. (D) A and B. (E) A, B, and C.

22. The chemiosomotic process in chloroplasts involves the
(A) establishment of a proton gradient. (B) diffusion of electrons through the thylakoid membrane. (C) oxidation of water to produce ATP energy. (D) movement of water by osmosis into the thylakoid space from the stroma. (E) reduction of carbon dioxide to glucose by NADPH and ATP.

23. Why are C_4 plants able to photosynthesize with no apparent photorespiration?
(A) They do not participate in the Calvin cycle. (B) They use PEP carboxylase to initially fix CO_2. (C) They are adapted to cold,wet climates. (D) They conserve water more efficiently. (E) They exclude oxygen from their tissues.

24. Root hairs are most important to a plant because they
(A) anchor a plant in the soil (B) store starches. (C) increase the surface area for absorption (D) provide a habitat for nitrogen-fixing bacteria. (E) contain xylem tissue.

25. Ignoring all other factors, what kind of day would result in the fastest delivery of water and minerals to the leaves of a tree?
(A) cool,dry day (B) warm,dry day (C) warm,humid day (D) cool,humid day (E) very hot,dry,windy day.

26. All of the following are elements that plants need in very small amounts (micronutrients) ***except***
(A) hydrogen (B) iron (C) chlorine (D) copper (E) zinc.

27. Most crop plants acquire their nitrogen mainly in the form of
(A) NH_3 (B) N_2 (C) CN_2H_2 (D) NO_3- (E) amino acids absorbed from the soil.

28. What is the function of calmodulin in a signal-transduction pathway?
(A) to receive the stimulus and activate the second messenger in the transduction step (B) to induce the selective activation of genes (C) to be a membrane-bound hormone receptor that causes an influx of Ca^{2+} (D) to form a complex with Ca^{2+} and activates specific molecules (E) to induce rapid responses such as stomatal closing or cell elongation

29. Plant hormones can have different effects at different concentrations. This is why

(背面仍有題目,請繼續作答)

(A) some plants are long-day plants and others are short-day plants (B) signal-transduction pathways in plants are different from those in animals. (C) plant genes recognize pathogen genes. (D) auxin can stimulate cell elongation in apical meristems,yet will inhibit the growth of axillary buds. (E) they really don't fit the definition of "hormone."

30. Incandescent light bulbs,which have high output of red light are *least* effective in promoting
(A) photosynthesis. (B) seed germination (C) phototropism. (D) flowering (E) entrainment of circadian rhythms.

31. The sea urchin belong to
(A) asymmetrical (B) radially (C) bilaterally (D) pseudocoelomate (E) acoelomate

32. Which of the following is common to both amphibian and mammalian development?
(A) holoblastic clevage (B) epiblast and hyblast (C) trophoblast (D) yolk plug (E) gray crescent

33. In the early development of an bird embryo, an important "organizer" is the
(A) neural tube (B) notochord (C) archenterons roof (D) dorsal lip of the blastopore (E) primitive streak

34. Vertebrate and sea urchin may seen as different as two animal groups can be, yet they share
(A) jaw adapted for feeding (B) a high degree of cephalization (C) the formation of structures from the neural crest (D) an endoskeleton that includes a cranium (E) the presence of deuterostoma

35. Unlike fish, both lamprey and hagfish
(A) lack fin (B) lack jaw (C) have external gill (D) belong to osteichthyes (E) only live freshwater

36. In addition to skeletal differences, bones fishes can be distinquished from cartilage fishes
(A) by the presence in bony fishes of many gill slits (B) by the presence in bony fishes o a lateral line (C) by the presence in cartilaginous fishes of unpaired fins (D) by the absence in cartilaginous fishes of a swim bladder (E) by the absence in cartilaginous fishes of elasmabranch.

37. Choose the phylum characterized by animals that have eucoelomate bodies
(A) Cnidaria (B) Platyhemlminthes (C) Porifera (D) Arthropoda (E) rotifer

38. Which of the following combinations of phylum and description is ***correct***?
(A) Echinodermata –bilateria, coelom from archenterons (B) Porifera – anus from blastopore (C) Nematoda –insect, pseudocoelomate (D) Platyhelminthes – flatworms, gastrovascular cavity, acoelomate (E) Chorda – pharygn slit, spinal cord

39. Which is the primitive body plan
(A) acoelomate (B) pseudocoelomate (C) eucoelamate (D) deuterostomes (E) bilateral

40. Butterfly belong to Phyluum
(A) annelid (B) crustacean (C) mollusca (D) arthropod (E) nematoda

41. What general genetic process is believed to account for the variety of cellular structures and functions in eukaryotic cells?
(A) variable gene activity. (B) negative control exclusively. (C) maternal environmental activities. (D) intron processing. (E) RNA processing.

42. Human males are much more likely to be have hemophilia (a failure of blood to clot properly) than human females. This is the case because
(A) hemophilia is a contagious disease to which males are more susceptible. (B) the gene for hemophilia is carried on the Y chromosome. (C) hemophilia is carried on the autosomes. (D) hemophilia is the wild type. (E) the gene for hemophilia is sex-linked.

43. Which of the following is LEAST related to the others in the list?
(A) Okazaki fragments. (B) replication fork. (C) heteroduplex. (D) DNA polymerase. (E) semiconservative.

44. What is the primer that is required to initiate the synthesis of a new DNA strand?
(A) RNA. (B) DNA. (C) protein. (D) ligase. (E) primase

45. Unlike prokaryotic DNA replication, eukaryotic DNA replication
(A) is completed by DNA polymerase. (B) cannot be completed by DNA polymerase. (C) is semiconservative. (D) has a single origin. (E) is error-free.

46. The information carried by a DNA molecule is in
(A) its amino acid sequence. (B) the sugars and phosphates forming its backbone. (C) the order of the nucleotides in the molecule. (D) the total number of nucleotides it contains. (E) the RNA units that make up the molecule.

47. At one point as a cell carried out its day-to-day activities, the nucleotides GAT were paired with the nucleotides CUA. This pairing occurred
(A) in a double-stranded DNA molecule. (B) during translation. (C) during transcription. (D) when an mRNA codon paired with a tRNA anticodon. (E) It is impossible to say, given this information.

48. An allele is
(A) one of the bases in DNA. (B) an alternate form of a gene. (C) another term for epistasis. (D) present only in males and is responsible for sex determination. (E) found in mitochondria

(背面仍有題目,請繼續作答)

but not in nuclei.

49. What types of ratios are likely to occur in crosses when dealing with a single gene pair?
(A) 9:3:3:1, 1:2:1. (B) 1:1:1:1, 1:4:6:4:1. (C) 3:1, 1:1, 1:2:1. (D) 9:7, 12:3:1. (E) 15:1, 1:2.

50. A condition in which one gene pair masks the expression of a non-allelic gene pair is called_____.
(A) codominance. (B) epistasis. (C) dominance. (D) recessiveness. (E) additive alleles.

51. Which description about HIV is wrong?
(A) The virion contains envelope and spikes. (B) Replication of viral RNA is catalyzed by reverse transcriptase. (C) Matured virus particles are released by budding from host cell membrane. (D) Only one molecule of RNA is present as genome inside each virion. (E) None of the above.

52. A lysogen is a bacterium harbouring
(A) a transposon. (B) prophage. (C) plasmid. (D) virulent phage. (E) R factor.

53. The functioning of enhancers is an example of
(A) transcriptional control of gene expression. (B) post-transcriptional modification of mRNA. (C) stimulation of translation. (D) post-translational control. (E) eukaryotic equivalent of prokaryotic promoter functioning.

54. Which of the following is wrong for describing causes of cancer development?
(A) gene amplification of proto-oncogene. (B) point mutation of proto-oncogene. (C) one-step, one-stage development. (D) functional failure of anti-oncogene. (E) oncogenic virus infection.

55. Which molecule is used as a template for *in vitro* synthesis of cDNA ?
(A) mRNA. (B) satellite DNA. (C) chromosomal DNA. (D) transposon DNA. (E) plasmid DNA.

56. An expression vector is a cloning vector that contains an additional
(A) restriction site. (B) enhancer. (C) promoter. (D) foreign gene. (E) drug resistance gene.

57. Immune tolerance for self can be broken, thus causing
(A) autoimmune disease. (B) immunodeficiency. (C) AIDS. (D) anaphylaxis. (E) graft versus host reaction.

58. Which of the following is not true for cytotoxic T cells?
(A) They function in cellular immunity. (B) They bear surface CD8 molecules. (C) They

attack target cells by releasing perforin. (D) They are activated by IL-2. (E) They are subject to infection by HIV.

59. Which function is not directly mediated by antibody?
(A) opsonization. (B) neutralization. (C) allergy. (D) B cell activation by specific antigen. (E) antigen presentation by macrophage to T helper cells.

60. Which of the following statements is wrong?
(A) Immunoglobulins have 5 classes. (B) IgG can cross the placenta. (C) Secretory IgA offers the mucosal immunity. (D) Monomeric immunoglobulin is composed of 2 polypeptides linked together by disulfide bonds. (E) Fab of an antibody is responsible for specific antigen-binding.

61. Who adopted a system for grouping similar species into a hierarchy of increasingly general categories?
(A) Aristotle. (B) Lamarck. (C) Linnaeus. (D) Curvier. (E) Mendel.

62. Which theory did Darwin use to explain the similarities and dissimilarities between Galápagos finches?
(A) natural selection. (B) descent with modification. (C) gradualism. (D) survival of the fittest. (E) inheritance of acquired characteristics.

63. In a village of the United States, one out of 10,000 babies is born with phenylketonuria (PKU), a metabolic disorder. The disease is caused by a recessive allele. (There are two alleles at this locus) If the population is under Hardy-Weinberg equilibrium, what is frequency of heterozygote three generations from now?
(A) 0.0198. (B) 0.010. (C) 0.990. (D) 0.0001. (E) 0.980.

64. Which evolutionary force of the followings generally results in genetic differentiation between populations?
(A) balancing selection. (B) migration. (C) outcrossing. (D) genetic drift. (E) introgression.

65. Plant species A has a chromosome number of 2n = 18. Plant species B has a chromosome number of 2n = 20. A new species, C, arises as an allopolyploid from hybridization between A and B. The chromosome number of C would probably be
(A) 12. (B) 14. (C) 16. (D) 28. (E) 19.

66. The largest unit in which gene flow is possible is a
(A) genus. (B) species. (C) population. (D) phylum. (E) order.

67. A group of species including the common ancestor and all offspring species is called

(背面仍有題目,請繼續作答)

(A) polyphyletic group. (B) monophyletic group. (C) paraphyletic groups. (D) artificial group. (E) outgroup.

68. Which morphological feature characterizes Class Mammalia
(A) four limbs. (B) ability to purr. (C) retractable claws. (D) meat-eating teeth. (E) hair.

69. One current debate raises the issue that, rather than beginning in shallow pools, life could have begun
(A) near deep-sea vents. (B) from viruses. (C) in northern Africa. (D) on dry land. (E) in Asia.

70. Which of the following represents a probable order in the biological history on Earth?
(A) eukaryotes before prokaryotes. (B) animals before algae. (C) metabolism before mitosis. (D) DNA genes before RNA genes. (E) an oxidizing atmosphere followed by a reducing atmosphere.

71. The protozoans that cause malaria in humans are:
(A) radiolarians. (B) trichosomes. (C) dinoflagellates. (D) sporozoans. (E) none of the above.

72. Most fungi develop a multicellular mass of filaments that spreads through the organic matter they are using as food. This mass is called a:
(A) mycelium. (B) hypha. (C) Sporangium. (D) ascoscarp. (E) None of the above.

73. Fungi in the division Oomycota are known as:
(A) egg fungi. (B) sac fungi. (C) club fungi. (D) cup fungi. (E) None of the above.

74. The part of a mushroom that is visible above the ground is a:
(A) basidiocarp. (B) zygospore. (C) ascoscarp. (D) ascogonium. (E) None of the above.

75. The largest reservoir of sulfur in the biosphere is the:
(A) atmosphere. (B) ocean. (C) organisms. (D) rocks. (E) None of the above.

76. Which of the following atoms most often limits the primary productivity of an ecosystem?
(A) Carbon. (B) Nitrogen. (C) Sulfur. (D) Phosphorus. (E) Hydrogen.

77. An ecological pyramid of energy flow is often an inverted pyramid in which of the following ecosystems?
(A) Desert. (B) Ocean. (C) Tundra. (D) Rainforest. (E) None of the above.

78. A consumer whose carbon atoms have already pass through three species is a:
(A) scavenger. (B) tertiary producer. (C) tertiary consumer. (D) secondary consumer. (E) secondary producer.

79. The first biocide used on a large scale was:
(A) DDT. (B) 2,4-D C. mercury (D) methane (E) None of the above.

80. When bacteria are rod-shaped, they are called:
(A) cocci. (B) spirilla. (C) vibrios. (D) bacilli. (E) sarcina.

81. The simple tissue that consists of relatively thin walled cells that function in food storage is
(A) collenchyma (B) parenchyma (C) sclenchyma (D) xylem (E) phloem

82. The structures visible to the naked eye on the back of some fern fronds are called
(A) annuli (B) sporangia (C) spores (D) sori (E) paraphysis

83. The SPOROPHYTE is the dominant generation for which group?
(A) Anthocerophyta (B) Hepatophyta (C) Bryophyta (D)Anthophyta (E) Charophyta

84. Match the structures (antheridium, archegonium,) with its function.
(A) protection (B) sexual reproduction (C) enhance dispersal (D) anchor plant (E) photosynthesis

85. Flowers are produced by which PHYLUM?
(A) Anthophyta (B) Cycadophyta (C) Gnetophyta (D) Pterophyta (E)Anthocerophyta

86. Which phylum is **NOT** a GYMNOSPERM?
(A) Coniferophyta (B) Gnetophyta (C) Gingkophyta (D) Cycadophyta (E) Lycophyta

87. What cell type has uneven cell walls and provides support to young plant organs?
(A) parenchyma (B) sclerenchyma (C) collenchyma (D) vessel (E) sieve

88. Monocots differ from dicots in
(A) leaf venation (B) vascular arrangement (C) number of floral parts (D) root type (E) all of the above

89. Which is **NOT** a basic plant tissue?
(A) dermal (B) meristematic (C) vascular (D) circulatory (E) ground

90. An imperfect flower
(A) is irregular in shape (B) is lacking petals or sepals (C) is lacking stamens or ovaries (D) has 4 of the 5 flower parts (E) all of the above

91. In the evolutionary history of Subphylum Vertebrate, which of the following orders of appearance of derived characters is correct?
(A) legs--- amniotic egg--- milk--- feather. (B) vertebral column --- jaws--- feather--- milk. (C) jaw--- leg--- lung or lung derivatives--- milk. (D) lung or lung derivatives--- amniotic egg--- leg--- feather. (E) lung or lung derivatives--- amniotic egg--- leg--- placenta.

92. *Macaca cyclopsis*, the only non-human Primate in Taiwan, shares all of the following characteristics with us except
(A) color vision. (B) bipedal posture. (C) fully opposable thumb. (D) nostrils open downwardly. (E) both eyes close together on the front of the skull.

93. The following cases are all examples of mimicry except
(A) a fly that resembles a bee. (B) a grasshopper that resembles a twig. (C) two poisonous species resemble each other. (D) a butterfly larva resembles a poisonous snake. (E) the mottled coloring pattern of moths that rest on lichens.

94. Dr. Dolittle wanted to estimate the population size of lizards on campus. He set up a transect line, and 50 lizards were captured, marked, and released. After a week, he surveyed again alone the transect line and caught 60 lizards, and 10 of the 60 lizards were previously marked. If all the assumptions for this mark-recapture method are met, approximately how many lizards there are on campus?
(A) 100. (B) 200. (C) 300. (D) 400. (E) 500.

95. Allopatric populations of species A and B have beaks of similar size, but on an island where both species occur, a significant difference in beak size has been observed. This case suggests the following statements except that
(A) resource partitioning occurs between two species in sympatry. (B) it is a case of character displacement. (C) it violate the competitive exclusion principle. (D) it may be an evolutionary outcome of past competition. (E) it enables the two species to reduce or avoid competition by feeding on seeds of different sizes.

96. A mother bird is gathering food for her chicks, constrained by the fact that she can not leave her chicks for more than 15 minutes. There are five plots with different conditions listed in the table below for her to choose. If everything else being equal, according to Optimal foraging theory, which plot will you predict this mother bird will go for foraging?

Plot	Time for travelling(min)	# of prey / m^2	chance of being eaten
1	5	10	0.1
2	5	15	0.1
3	10	20	0.2
4	10	25	0.2
5	20	50	0

(A) Plot 1. (B) Plot 2. (C) Plot 3. (D) Plot 4. (E) Plot 5.

97. If species A is a key-stone predator of a community, its effect on that community may be on
(A) closely co-evolving with one species of prey. (B) creating suitable environments for prey

species. (C) increasing the relative abundance of other predators. (D) feed on prey species that is dominant and the competitors of other species. (E) competitively exclude other predators from the community.

98. Which of the following population-limiting factors is independent of population density?
(A) Disease. (B) Predation. (C) Catastrophe. (D) Competition. (E) Aggressive interaction.

99. Animals that are small in size and produce many young in one breeding season in general
(A) can reproduce for many years. (B) usually inhabit stable, well established environments. (C) exhibit intensive parental care. (D) live at a density below carry capacity. (E) face a higher rate of juvenile mortality.

100. If high parental investment from both parents is required for animal species X to produce young successfully, what would you expect their mating system most likely is?
(A) Monogamy. (B) Promiscuity. (C) Polyandry. (D) Polygyny. (E) Both Polyandry and Polygyny.

101. What are essential amino acids?
(A) those that are absent in fruits and vegetables (B) the only amino acids found in human proteins (C) those amino acids that are generally more abundant in vegetables than in meat (D) one class of vitamins that is indispensable for neurological development (E) molecules that are not synthesized by most animals

102. How does the digestion and absorption of fat differ from that of carbohydrates?
(A) Processing of fat does not require any digestive enzymes, whereas the processing of carbohydrates does. (B) Fat absorption occurs in the stomach, whereas carbohydrates are absorbed from the small intestine. (C) Carbohydrates need to be emulsified before they can be digested, whereas fats do not. (D) Most absorbed fat first enters the lymphatic system, whereas carbohydrates directly enter the blood. (E) Fat must be worked on by bacteria in the large intestine before it can be absorbed, which is not the case for carbohydrates.

103. What is the reason that fluid is forced out of systemic capillaries at the arteriolar end?
(A) The osmotic pressure of the interstitial fluid is greater than that of the blood. (B) The hydrostatic pressure of the blood is less than that of the interstitial fluid. (C) The hydrostatic pressure of the blood is greater than the osmotic pressure of the interstitial fluid. (D) The osmotic pressure of the interstitial fluid is greater than the hydrostatic pressure of the blood. (E) The osmotic pressure of the blood is greater than the hydrostatic pressure of the interstitial fluid.

104. If a molecule of CO_2 released into the blood in your left toe travels out of your nose, it must

(背面仍有題目,請繼續作答)

pass through all of the following structures except the
(A) right atrium. (B) pulmonary vein. (C) alveolus. (D) trachea. (E) right ventricle.

105. A person with a tidal volume of 450 ml, a vital capacity of 4000 ml, and a residual volume of 1000 ml would have a potential total lung capacity of
(A) 1450 ml. (B) 4000 ml. (C) 4450 ml. (D) 5000 ml. (E) 5450 ml.

106. All of the following statements about gametogenesis are true **except**:
(A) Spermatogenesis continues throughout the male's life; oogenesis stops at menopause. (B) Oogenesis results in one ovum, while spermatogenesis results in millions of sperm. (C) Spermatogenesis is a continuous, uninterrupted process; oogenesis undergoes long resting periods. (D) The process of oogenesis is completed when the egg cell is penetrated by sperm. (E) The primary spermatocyte is a haploid cell.

107. If the release of LH were inhibited in a human female, which of the following events would not occur?
(A) release of FSH from the pituitary (B) maturation of a primary follicle and oocyte (C) ovulation of a secondary oocyte (D) release of GnRH from the hypothalamus (E) production of estrogen by follicle cells

108. If an egg cell contained EDTA, a chemical that binds calcium and magnesium, what effect would this have on reproduction?
(A) The acrosomal reaction would be blocked. (B) The fusion of sperm and egg nuclei would be blocked. (C) The fast block to polyspermy would not occur. (D) The fertilization envelope would not be formed. (E) The zygote would not contain 46 chromosomes.

109. If gastrulation did not occur,
(A) cleavage would not occur in the zygote. (B) the embryonic germ layers would not form. (C) fertilization would be blocked. (D) the blastula would not be formed. (E) B and D would be the case.

110. Which structure in bird and mammalian embryos functions like the blastopore of frog embryos?
(A) primitive streak (B) neural plate (C) archenterons (D) notochord (E) somites

111. Which of the following is part of the central nervous system (CNS)?
(A) cranial nerve (B) spinal nerve (C) ganglion (D) sympathetic nerve (E) spinal cord

112. Which of the following best describes a nerve signal?
(A) the flow of electricity along a neuron (B) the movement of tiny filaments of protein inside a neuron (C) the flow of neurotransmitter chemical along a neuron (D) the passage of ions through the membrane of a neuron (E) the change in a neuron so that the inside becomes more negatively charged

113. Complex fire/don't fire "decision making" by neurons is most directly a result of the fact that _____.

(A) excitatory neurotransmitters cause "positive" action potentials and inhibitory neurotransmitters cause "negative" action potentials (B) action potentials of various sizes can sum to a threshold potential (C) neurons receive a combination of ion currents from both excitatory and inhibitory synapses (D) chemical transmission allows signals to be transmitted in both directions across a synapse (E) all of these occur

114. A thermoreceptor in the skin converts heat energy to nerve impulses. This conversion is called _____.

(A) sensation (B) sensory transduction (C) reception (D) integration (E) perception

115. Which of the following is **NOT** involved when information about taste intensity is transmitted to the brain?

(A) the frequency of action potentials (B) the number of stimulus molecules that bind to receptor cell membranes (C) the strength of a receptor potential (D) the number of sensory neurons that transmit action potentials (E) the strength of an action potential

116. Damage to the nerve from the utricle and saccule to the brain could result in ___.

(A) dizziness (B) blindness (C) loss of the sense of taste (D) loss of the sense of smell (E) deafness

117. In general, locomotion requires an animal to expend energy to overcome _____.

(A) friction only (B) gravity only (C) friction and gravity (D) the tendency to lose balance (E) momentum

118. The most inclusive level of organization in nature is the _____.

(A) cell (B) biosphere (C) community (D) population (E) ecosystem

119. In lakes and ponds, eutrophication occurs when _____; it can lead to _____.

(A) levels of dissolved CO_2 rise ... bicarbonate levels too high to support life (B) pesticides are washed off agricultural land ... decreased aquatic biodiversity (C) toxic substances accumulate in lake sediments ... biohazards in the food web (D) nutrients from human-altered terrestrial ecosystems are deposited in the water body ... anaerobic conditions in deeper waters (E) primary producers are killed by pollution ... starvation of organisms at higher trophic levels

120. Fire helps to maintain the existence of which biomes?

(A) savanna, chaparral, temperate grassland, and coniferous forest (B) tropical forest, savanna, chaparral, temperate grassland, and coniferous forest (C) savanna, desert, chaparral, temperate grassland, and temperate deciduous forest (D) savanna, chaparral, temperate grassland, tundra, and coniferous forest (E) savanna and chaparral