單一選擇題，共 130 題（每題 10/13 分）

1、 During the process of digestion, fats are broken down when fatty acids are detached from glycerol and proteins are degraded when amino acids are separated from each other. What do these two processes have in common?
(A)Both involve the addition of a water molecule to break bonds. (B) Both processes can be catalyzed by the same enzyme. (C) Both processes occur intracellularly in most organisms. (D)Both require ATP as an energy source. (E) Both require the presence of hydrochloric acid to lower pH.

2、 Without functioning parietal cells an individual would
(A)not be able to intiate mechanical digestion in the stomach. (B) not be able to initiate protein digestion in the stomach. (C) not be able to produce pepsinogen. (D)only be able to digest fat in the stomach. (E) not be able to initiate digestion in the small intestine.

3、 In which group of animals would you expect to find a relatively long cecum?
(A)herbivores (B)heterotrophs (C)carnivores (D)humans (E)autotrophs

4、 Why is internal fertilization considered more advantageous than external fertilization?
(A)The time and energy devoted to reproduction is decreased. (B) Usually a smaller number of genes are present, which promotes genetic stability (C)The increased survival rate results in rapid population increases. (D)The smaller number of offspring often receive a greater amount of parental protection. (E) Usually fewer offspring are produced, so ample food supply is available.

5、 In vertebrate animals, spermatogenesis and oogenesis differ, in that
(A)oogenesis produces four haploid cells, whereas spermatogenesis produces only one functional spermatozoon. (B)oogenesis produces one functional ovum, whereas spermatogenesis produces four functional spermatozoa. (C) oogenesis begins at the onset of sexual maturity. (D) spermatogenesis begins before birth. (E) spermatogenesis is not complete until fertilization occurs.

6、 Which of the following hormones is incorrectly paired with its action?
(A)luteinizing hormone-stimulates ovulation (B) GnRH-controls release of FSH and LH (C)estrogen-responsible for primary and secondary female sex characteristics (D)human chorionic gonadotropin-maintains secretions from the corpus luteum (E) progesterone-stimulates follicles to develop

7、 Human fertility drugs increase the chance of multiple births, probably because they
(A)prevent parturition. (B) stimulate follicle development. (C) mimic progesterone. (D) stimulate spermatogenesis. (E) enhance implantation.

（背面仍有題目，請繼續作答）

8、 The cortical reaction functions directly in the
(A)fusion of egg and sperm nuclei. (B) release of hydrolytic enzymes from the sperm cell. (C) generation of a nervelike impulse by the egg cell. (D) production of a fast block to polyspermy. (E) formation of a fertilization membrane.

9、 Which developmental sequence is correct?
(A)cleavage, morula, blastula, and gastrula (B) morula, cleavage, gastrula, and blastula (C) cleavage, gastrula, morula, and blastula (D)cleavage, blastula, gastrula, and morula (E)gastrula, morula, blastula, and cleavage

10、 In frogs, formation of the eye lens is induced by chemical signals from
(A)mesodermal cells. (B)ectodermal cells. (C) endodermal cells. (D) A and B. (E) A, B, and C.

11、 Herring gulls fiercely defend the areas around their nests in cliff-top breeding colonies. Within the colony they would show a _____ dispersion pattern.

(A)uniform (B)random (C)dense (D)density-dependent (E)clumped

12、 Chimpanzees have a relatively low birth rate. They take good care of their young, and most chimps live a long life. The chimp survivorship curve would look like _____.
(A) a line that slopes gradually upward
(B) a relatively flat line that drops steeply at the end
(C) a line that drops steeply at first, then flattens out
(D) a line that slopes gradually downward
(E) a horizontal line

13、 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) 1122

14、 The term used to describe a harmless organism resembling a harmful one is _____.
(A) resemblance (B) Batesian mimicry (C) warning coloration (D) cryptic (E)Müllerian mimicry

15、 Keystone species are those species _____.
(A) whose absence would cause major disruption in an ecosystem
(B) that live primarily on or under rocks and stones
(C) that have provided key foods and medicines

(D) with the largest number of individuals in an ecosystem
(E) that none of the above applies to

16、The current view of succession is _____.
(A) expressed by the equilibrial model
(B) that disturbance and nonequilibrium are inevitable
(C) that it ends once the climax community is established
(D) that it proceeds in a linear fashion
(E) none of the above

17、Why is a diagram of energy flow from trophic level to trophic level shaped like a pyramid?
(A) Organisms at each level store most of the energy and pass little on.
(B) There are more producers than primary consumers, and so on.
(C) Organisms eventually die as they get older.
(D) Most energy at each level is lost, leaving little for the next.
(E) Secondary consumers are larger than primary consumers, and so on.

18、Consider this segment of a food web: Snails and grasshoppers eat pepper plants; spiders eat grasshoppers; shrews eat snails and spiders; owls eat shrews. The shrew occupies the trophic level(s) of a _____.
(A) primary consumer (B) secondary consumer (C) tertiary consumer (D) primary and secondary consumers (E) secondary and tertiary consumers

19、Which one of the following processes does NOT increase the concentration of greenhouse gases in the atmosphere?
(A) using coal to generate electricity
(B) increasing the number of cows and sheep to help feed a growing human population
(C) burning tropical rain forests to clear land for grazing
(D) failing to repair leaks in natural gas pipelines
(E) putting salt on roads to prevent ice from forming

20、Ospreys and other top predators in food chains are most severely affected by pesticides such as DDT because _____.
(A) their systems are especially sensitive to chemicals
(B) of their rapid reproductive rates
(C) the pesticides become concentrated in their prey
(D) they cannot store the pesticides in their tissues
(E) they are directly exposed to pesticides in the air

21、A man who has type B blood and a woman who has type A blood could have children of which

of the following phenotype?
(A) A or B only (B) AB only (C) AB or O (D) A, B, or O (E) A, B, AB, or O

22、 Which of the following correctly ranks the structures in order of size, from largest to smallest?
(A) gene-chromosome-nucleotide-codon (B) chromosome- gene-codon -nucleotide
(C) nucleotide- chromosome- gene-codon (D) chromosome-nucleotide- gene-codon
(E) gene-chromosome- codon-nucleotide

23、 A geneticist found that a particular mutation had no effect on the polypeptide coded by a gene. This mutation probably involved
(A) deletion of one nucleotide (B) alternation of the start codon
(C) insertion of one nucleotide (D) deletion of the entire gene
(E) substitution of one nucleotide

24、How many different types of gametes can an individual with the genotype AaBBccDdEeFf form?
(A) 4 (B)12 (C)16 (D) 64 (E) 256

25、 Which of the following is the correct order of increasing levels of chromosome packing (smallest to largest)?
(A) Nucleosomes-loops-solenoid-supercoils (B) Solenoid-nucleosomes-loops-supercoils
(C) Solenoid-nucleosomes-supercoils-loops (D)Nucleosomes-solenoid-loops-supercoils
(E) Solenoid-loops-nucleosomes-supercoils

26、 How does the karyotype of a person with Down syndrome differ from that of a nonaffected individual?
(A)The person has three copies of chromosome 18 (B) The person has one copy of chromosome 21 (C) The person has three copies of chromosome 21 (D)The person has one copy of chromosome 18 (E) The person three copies of chromosome 13

27、Mendel's law of independent assortment has its physical basis in the:
(A) separation of alleles into haploid cells (B) spindle attachment in anaphase I (C) random arrangement of chromosomes on the metaphase plate in meiosis I (D) sister chromatids separating in meiosis II (E) haploid cells forming

28、The arrangement of nucleotides of a cDNA precisely delineates the _____ of a gene; this is because cDNA is generated from _____.
(A) introns; ESTs (B) exons; ESTs (C)exons; mRNA (D) introns; amino acids
(E) introns; Mrna

29、Which of the below is not true about the location of enhancers?
(A) They can be found upstream of the transcription initiation site (B) They can be found downstream of the promoter (C) They can be found in introns (D) They can be found 3′of the polyadenylation site (E) The position of the enhancer has no effect on gene regulation

30、Which of the following acts before the others?
(A) tRNA alignment with mRNA (B) aminoacyl-tRNA synthetase
(C) RNA polymerase (D) ribosome movement to the next codon
(E) amino acid chain elongation

31、Endospores represent a challenge to the fields of industrial and medical microbiology because
(A) they are resistant to harsh environments, thus allowing survival of sporing organisms under conditions in which nonsporing organisms would not survive. (B) spore forming organisms are often dangerous pathogens. (C) Both of these answers are correct. (D) Neither of these answers is correct.

32、In the Gram-staining procedure, the decolorizer is
(A) iodine. (B) safranin. (C) crystal violet. (D) alcohol

33、Who of the following was the first to observe and accurately describe microorganisms?
(A) Pasteur (B) Lister (C) van Leeuwenhoek (D) Tyndall

34、Which of the following is (are) used to define the field of microbiology?
(A) the size of the organism studied (B) the techniques in the study of organisms regardless of their size (C) both the size of the organism studied and the techniques employed in the study of organisms regardless of their size (D) neither the size of the organism studied nor the techniques employed in the study of organisms regardless of their size

35、Which of the following is not true of bacterial plasmids?
(A) They can exist and replicate independently of the chromosome. (B) They may carry genes for drug resistance. (C) They are required for host growth and/or reproduction. (D) They may carry genes that enhance the metabolic capabilities of the bacterium.

36、In the absence of transport proteins, which of the following passes more rapidly through a cell membrane?
(A) water; (B) glucose; (C) sodium ion; (D) cellulose (E) all of the above.

37、Regarding the periplasmic space:

(A) it is found only in Gram-positive bacteria.
(B) it is located between the plasma membrane and outer membrane of Gramnegative bacteria.
(C) it contains hydrolytic enzymes and binding proteins involved in nutrient acquisition.
(D) both b and c are true.

38、Which of the following is considered to be a differential staining procedure?
(A) Gram stain (B) Acid-fast stain (C) Both Gram stain and Acid-fast stain.
(D) Leifson's flagella stain.

39、The instrument that produces a bright image of the specimen against a dark background is called
a(n) _____ microscope.
(A) phase-contrast (B) electron (C) bright-field (D) dark-field

40、Who of the following provided the evidence needed to discredit the concept of spontaneous generation?
(A) Pasteur (B) Koch (C) Semmelweiss (D) Lister

41、A hormone with a protein structure would _____ as a first step in triggering a specific response from a target cell.
(A) penetrate the cell membrane and bind with an intracellular receptor.
(B) bind with a cell surface receptor
(C) trigger an immune response
(D) bind with a free receptor molecule in the blood stream

42、Which of the following hormones is secreted by the adrenal gland in response to stress and promotes the synthesis of glucose from non-carbohydrate substances?
(A) Cortisol (B) Glucagons (C) ACTH (D) Epinephrine (E) thyroxine

43、Short blood vessels connect two sets of capillaries lying in the
(A) hypothalamus and thyroid. (B) liver and spleen.
(C) spinal cord and adrenal medulla. (D) hypothalamus and anterior pituitary.
(E) anterior pituitary and posterior pituitary.

44、Animal movement is based on
(A) the active extension of muscles. (B) the active contraction of muscles
(C) hair cells in the ear. (D) fear.

45、One would expect to find the proteins actin and myosin in
(A) the axon of a motor neuron. (B) the neutrophils, eosinophils, and basophils.

(C) the myofibrils of muscle cells. (D) the red blood cells. (E)the proximal tubule of the nephron.

46、Rods are
(A) concentrated in the fovea. (B) the only photoreceptors which contain opsins.
(C) sensitive mainly to blue, green, or red light in humans. (D) the only photoreceptors which contain rhodopsin. (E) A and D are correct.

47、When sensory input (sound, light, etc.) is received, a sensory receptor cell _____ in response.
(A) repolarizes (B) polarizes (C) hyperpolarizes (D) depolarizes (E) does nothing

48、 Receptors that bind to neurotransmitters are found
(A) at the nodes of Ranvier. (B) in the nucleus of the postsynaptic cell. (C) on the presynaptic membrane. (D) on the postsynaptic membrane. (E) in the interstitial fluid that fills the synaptic cleft.

49、Synaptic vesicles contain
(A) Ca2+ (B) K+ (C) steroid hormone (D) neurotransmitters (E) Na+

50、 Calcium channels in the axon terminal open in response toA). at the nodes of Ranvier.
(A) depolarization. (B) hyperpolarization. (C) transmitter. (D) ligand. (E) opening of K+ channels

51、liver derived from
(A) ectoderm (B) endoderm (C) mesoderm (D) somites (E) coelom

52、primitive streak produce in
(A) insect (B) frog (C) fish (D) sea star (E) snail

53、In the early development of an amphibian embryo, an important "organizer" is the
(A) neural tube (B) notochord (C) archenterons roof (D) dorsal lip of the blastopore
(E) dorsal ectoderm

54、Unlike eutherian mammals, both monotremes and marsupials
(A) lack nipples (B) have some embryonic development outside the mother's uterus
(C) lay eggs (D)are founding Australia and Africa (E) include only insectvores and herbivores

55、Which of the following structures or substances is *incorrectly* paired with a tissue?
(A) Haversian system – bone (B) platelets – blood (C) Fibroblast – skeleton muscle

(背面仍有題目，請繼續作答)

(D) Chondroitin sulfate – cartilage (E) Basement membrane – epithelium

56、Which is not extraembryonic membrane
(A) amnion (B) allantois (C) chroin (D) york sac (E) fertilizer membrane

57、shrimp belong to Phyluum
(A) annelid (B) crustacean (C) mollusca (D) chordate (E)nematode

58、hafish belong to
(A) cartilage fish (B) bony fish (C) jawed fish (D) gnathofish (E) jawless fish

59、crabfish belong to
(A) insecta (B) arachnida (C) crustacean (D) bony fish (E) cartilage fish

60、Complete metamorphosis is advantageous for all of the following reasons *except*
(A) it permits a larval stage specialized for feeding and growth
(B) it permits an adult stage specialized for dispersal and reproduction
(C) pupae can suspend development and become dormant during periods of environmental stress
(D) adults can be more mobile, improving the probability of locating a mate
(E) feeding adults can disperse to new food resources, thus avoiding competition with larvae

61、The naked virus does not contain
(A) RNA. (B) DNA. (C) core. (D) envelope. (E) none of the above.

62、The provirus is
(A) a virulent virus. (B) the viral DNA integrated into host cell genome. (C) a prion. (D) a viroid. (E) none of the above.

63、The tandemly repetitive DNA sequence in eukaryotic genome is called
(A) transposon. (B) plasmid. (C) satellite DNA. (D) vector DNA. (E) insertion sequence.

64、Which of the following is an example of a possible step in the translational control of gene expression?
(A)the addition of methyl groups to cytosine bases of DNA. (B) the binding of transcription factors to a promoter. (C) the alternative RNA splicing. (D) histone acetylation.
(E) activation of enhancers.

65、The success of DNA technology depends on the application of
(A) restriction endonuclease. (B) heat-resistant DNA polymerase. (C) DNA vector. (D) DNA ligase. (E) all of the above.

66、The cDNA can not be
(A) amplified by PCR. (B) used to create a complete genomic library. (C) produced from mRNA using reverse transcription. (D) used as a gene probe. (E) cloned into an expression vector.

67、An epitope is
(A) a small piece of oligonucleotide. (B) the whole polypeptide sequence of a protein. (C) the shortest antigenic determinant on a protein. (D) the shortest immunogenic fragment of a protein. (E) an adjuvant.

68、Which procedure does not need HLA typing?
(A) bone marrow transplantation. (B) liver transplantation. (C) kidney transplantation. (D) cornea transplantation. (E) heart transplantation.

69、The neutralization of virus infectivity is mediated by
(A) antibody. (B) cytotoxic T cell. (C) neutrophils. (D) NK cell. (E) RNA interference.

70、Which of the following statements is wrong?
(A) Helper T cells function as IL-2 producer. (B) Plasma cells function as memory B cells. (C)B cells can also act as antigen presenting cells. (D)CD4 is the marker of helper T cell. (E) Macrophage is an antigen presenting cell.

71、In a village of the United States, 16 out of 6,400 babies were 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) 0.048. (B) 0.025. (C) 0.975. (D) 0.095. (E) 0.050.

72、Which evolutionary force promotes balanced polymorphisms in sickle-cell anemia locus?
(A) Negative selection (B) Frequency-dependent selection (C) Neutralism (D) Migration (E) Genetic drift

73、Plant species A has a chromosome number of 2n = 26. Plant species B has a chromosome number of 2n = 18. A new species, C, arises as an allopolyploid from hybridization between A and B followed by polyploidization. The chromosome number of C would probably be
(A) 44. (B) 22. (C) 52. (D) 36. (E) 38.

74、Biologists have found more than 500 species of fruit flies on the various Hawaiian Islands, all apparently descent from a single common ancestor. This example illustrates
(A) special creation (B) use and disuse (C) adaptive radiation (D) introgression

(E) polyploidization

75、Which evolutionary force of the followings generally disturbs genetic differentiation between populations?
(A) postive selection. (B) migration. (C) inbreeding (D) genetic drift (E) mutation

76、A group consisting of a common ancestor and all offspring species is called a(n)
(A) monophyletic group (B) paraphyletic group (C) polyphyletic group (D) sister group
(E) artificial group

77、 In a population of Hardy-Weinberg equilibrium, at a locus with alleles A and a, frequencies of AA, Aa, and aa are 0.49, 0.42, and 0.09, respectively. 100 generations from now, the frequency of A will be
(A) 0.2 (B) 0.3 (C) 0.8 (D) 0.7 (E) 0.6

78、Two birds in the same genus may not be in the same
(A) order (B) family (C) phylum (D) class (E) species

79、Which mode of natural selection will maintain genetic polymorphisms?
(A) negative selection (B) positive selection (C)directional selection (D) balancing selection
(E) diversifying selection

80、The processes of _____ and _____ generate variation, and _____ produces adaptation to the environment.
(A) genetic drift ..... mutation ..... migration
(B) mutation ..... migration..... genetic drift
(C) mutation .... sexual recombination ..... natural selection
(D) sexual recombination ..... natural selection ..... system of mating
(E) natural selection ..... mutation ..... Founder effect

81、Glucose and hexanoic acid each contain six carbon atoms, but they have completely different properties. Glucose is necessary in food; hexanoic acid is poisonous. Their differences must be due to different
(A) monomers. (B) macromolecules. (C) hydrolysis. (D) quaternary structures.
(E) functional groups

82、The first organic molecule to be synthesized was
(A) urea. (B) acetic acid. (C) ammonium cyanate. (D) insulin. (E) DNA

83、The four main categories of macromolecules in a cell are

(A) proteins, DNA, RNA, and steroids. (B) monosaccharides, lipids, polysaccharides, and proteins. (C) proteins, nucleic acids, carbohydrates, and lipids. (D) nucleic acids, carbohydrates, monosaccharides, and proteins. (E) RNA, DNA, proteins, and carbohydrates.

84、Which of the following do nucleic acids and proteins have in common?
(A) They are both made of amino acids. (B) Their structures contain sugars. (C) They are hydrophobic. (D) They are large polymers. (E) They each consist of four basic kinds of subunits.

85、A shortage of phosphorus in the soil would make it especially difficult for a plant to manufacture
(A) DNA. (B) proteins. (C) cellulose. (D) fatty acids. (E) sucrose.

86、The primary sealants that plug leaks in blood vessels are
(A) platelets and fibrin. (B) red blood cells and albumin. (C) fibrin and white blood cells. (D) white blood cells and platelets. (E) hemoglobin and platelets.

87、In a fish, blood circulates through ____, while in a mammal, it circulates through ____.
(A) two circuits . . . four circuits (B) one circuit . . . two circuits
(C) four circuits . . . two circuits (D)one circuit . . . four circuits (E) two circuits . . . one circuit

88、Stroke occurs when
(A) the pacemaker becomes defective, producing an irregular heartbeat. (B) a blood clot enters and blocks one of the coronary arteries. (C)a blood clot dislodges from a vein and moves into the lung, where it blocks a pulmonary artery. (D) a blood clot enters the cerebral circulation, blocking an artery and causing the death of brain tissue. (E)the walls of an artery accumulate deposits and lose their flexibility and elasticity.

89、Which of the following is an endotherm?
(A) mouse (B) iguana (C) frog (D) trout (E)all of the above

90、Which of the following is the most accurate and comprehensive description of the function of the kidneys?
(A) breaking down body wastes (B) excreting wastes (C) regulating body fluid composition (D)filtering the blood (E) producing urine

91、Which of the following is *not* a known function of the cytoskeleton?
(A) to maintain a critical limit on cell size (B) to provide mechanical support to the cell (C) to maintain characteristic shape of the cell (D) to hold mitochondria and other organelles in place within the cytosol (E) to assist in cell motility by interacting with specialized motor proteins

(背面仍有題目，請繼續作答)

92、The signaling system in an animal cell lacking the ability to produce GTP
(A) would not be able to activate and inactivate the G protein on the cytoplasmic side of the plasma membrane (B) could activate only the epinephrine system (C) was discovered by Sutherland, who won the Nobel Prize for this work (D) would be able to carry out reception and transduction, but would not be able to respond to a signal

93、The signal-transduction pathway in animals that use epinephrine
(A) involves activation of glycogen breakdown in liver and skeletal muscle cells (B) is a classic example of synaptic signaling (C) is a classic example of paracrine signaling (D) operates independently of hormone receptors on target cells (E) None of these describes the epinephrine system

94、The activation of tyrosine-kinase receptors is characterized by
(A) aggregation and phosphorylation (B) IP_3 binding (C) calmodulin formation
(D) GTP hydrolysis (E) channel protein conformational change

95、Of the following, which has *not* proven to be a useful model organism in the study of developmental genetics?
(A) humans (B) *Drosophila* (C) *Arabidopsis* (D) *Caenorhabditis* (E) mice

96、What structure is often deposited in several laminated layers and has a strong and durable matrix that affords the cells protection and support?
(A) primary cell wall (B) secondary cell wall (C) middle lamella (D) glycocalyx
(E) tonoplast

97、Suppose a mutation occurred in *Drosophila* in the region of DNA that codes for the protein called bicoid. What is most likely to happen during development?
(A) Two sets of limbs will form in a mirror-image arrangement. (B) The polarity of the fertilized egg will be disrupted. (C) The transcription of developmental genes will stop. (D) The embryos will express their father's genotype. (E) The fertilized egg will be bipolar.

98、Which of the following is *least* related to the others?
(A)gap genes (B)cyclin genes (C)pair-rule genes (D)segment-polarity genes
(E)segmentation genes

99、In which of the following pairs are the two terms truly equivalent?
(A) ovule-egg (B) embryo sac-female gametophyte (C) endosperm-male gametophyte
(D) seed-zygote (E) microspore-pollen grain

100、Which of the following statements is *true*?Transgenic plants
(A) can be produced only by genetic engineering (B) contain genes from more than one

species
(C) require intermediate species for the transgenic plant to be produced (D)require many years to be produced (E) A and D are correct statements

101、The best word to describe the growth of plants in general is
(A) perennial. (B) weedy. (C) indeterminate. (D) primary. (E) derivative.

102、Which of the following best explains why no tall trees seem to be CAM plants?
(A) They would be unable to supply sufficient sucrose for active transport of minerals into the roots during the day or night. (B) With the stomates open at night, the transpiration rate would limit plant height. (C)Since the stomates are closed in the leaves, the Casparian strip is closed in the endodermis of the root. (D)Transpiration occurs only at night, and this would cause a highly negative [] in the roots of a tall plant during the day. (E) They would be unable to move water and minerals to the top of the plant during the day.

103、Which of the following is a true statement about growth in plants?
(A) Only primary growth is localized at meristems. (B) Some plants lack secondary growth.
(C) Only stems have secondary growth. (D) Monocots have only primary growth and dicots have only secondary growth. (E) Only secondary growth produces reproductive structures.

104、As a research scientist, you measure the amount of ATP and NADPH consumed by the Calvin cycle in 1 hour. You find 30,000 molecules of ATP consumed, but only 20,000 molecules of NADPH. Where did the extra ATP molecules come from?
(A) photosystem I (B) photosystem II (C) noncyclic electron flow (D) cyclic electron flow
(E) chlorophyll

105、Photorespiration lowers the efficiency of photosynthesis by removing which of the following from the Calvin cycle?
(A) glyceraldehyde phosphate molecules (B) ribulose bisphosphate molecules
(C) carbon dioxide molecules (D)RuBP carboxylase molecules (E) ATP molecules

106、A tree will eventually die if it is girdled, meaning that a ringlike cut has been made all the way around the trunk to a depth just below the bark. The cause of death is mainly
(A) the killing of bark cells. (B) destruction of the plant's ability to continue primary growth.
(C) destruction of the procambium. (D) destruction of the cork cambium, phloem, and vascular cambium. (E) destruction of axillary buds.

107、Which of the following has the lowest (most negative) water potential?
(A)trunk xylem (B) soil (C) leaf air spaces (D)root xylem (E) leaf cell walls

(背面仍有題目，請繼續作答)

108、The bulk of a plant's dry weight is derived from
(A) the oxygen from H2O. (B) soil minerals. (C) the hydrogen from H2O. (D) CO2.
(E) the uptake of organic nutrients from the soil.

109、Which soil mineral is most likely to be leached away due to a hard rain?
(A) H^+ (B) Na^+ (C) CA^{++} (D) K^+ (E) NO^{3-}

110、The function of a root nodule's leghemoglobin is to
(A) regulate the supply of oxygen to Rhizobium. (B) promote ion exchange in the soil.
(C) form a mutualistic relationship with insects. (D) supply the legume with fixed nitrogen.
(E) extract macronutrients from the soil.

111、When we move along altitudinal and latitudinal gradients, we usually will find a similar pattern of sequential change in biota. In both cases there will be also equivalent changes along the gradient in all of the following except?
(A) Temperature (B) Humidity (C) Vegetation (D) Day length (E) Communities.

112、Diversity often refers to two properties that are used to measure species composition of a community. Which of the following systems is the most diverse?
(A) 3 species exist, each with 25, 2, and 100 individuals, respectively (B)7 species exist, 5 with 10 individuals and the rest 2 species with 400 individuals (C) 5 species exist, each with 300 individuals (D) 6 species exist, each with 200 individuals (E) Only 1 species with 2000 individuals.

113、In the logistic model of population growth, how carrying capacity (*K*) and population size (*N*) can influence growth rate (*dN/dt*) of a population?
(A) The increase in actual population numbers is greatest when N is small (B) As *N* approaches *K*, the intrinsic rate of increase, *r*, becomes smaller (C) When *K* is small, the population begins growing exponentially (D) As *N* approaches *K*, the birth rate approaches zero (E) When *N* equals *K*, population growth is zero.

114、All of the following statements about trophic structure are correct except:
(A) Total biomass declines with each trophic level. (B) A community can not exist without autotrophic specie (C) The connectance in a food web increases as the species richness increases (D) About 90% of the energy at one trophic level does not appear at the next (E) Top predators tend to be rather large and sparsely distribute, whereas herbivores are smaller and are common.

115、According to the concept of competitive exclusion,
(A) Two species can not coexist in the same habitat (B) Two closely related species can not

breed at the same time (C) Two species can not share the exact same niche in a community (D)Two species eat the exact same food item can not coexist in the same food-web (E) Two species compete for the same resource will eventually cause one species going extinction.

116、The core idea of sociobiology is that
(A) Environment outweighs genes in human behavior. (B) Human social structure is predetermined by inheritance. (C) Many aspect of social behavior have an evolutionary basis. (D) The social behavior of human is comparable to that of chimpanzee. (E) Group selection is the selection force of social behavior in animals.

117、What does the species equitability of a community refer to?
(A) The species diversity (B) The number of difference species (C) Both the species diversity and the number of difference species (D) The relative numbers of individuals in each species
(E) The feeding relationships of trophic structure

118、There is a species of trilobite that is found from only two areas in the world, Kentucky and southwestern Scotland. Which of the answers below explains this distribution?
(A) Wind patterns (B) Dispersal by man (C) Plate tectonics
(D) Convergent evolution (E) Allopatric speciation

119、Which of the following conditions is the most likely indicator of a population in an extinction vortex?
(A)The species is rare (B) The effective population size is around 300 (C) Sex ratio is not 1:1
(D) continuous loss of genetic variation (E) Low breeding rate.

120、The application of ecological principles to returning a degraded ecosystem to its previous natural state is a specific characteristic of
(A) Conservation ecology (B) Ecological engineering (C) Restoration ecology
(D) Landscape ecology (E) Community ecology

121. Which of the following clues would tell you whether a cell is prokaryotic or eukaryotic?
(A)the presence or absence of a rigid cell wall (B) whether or not the cell is partitioned by internal membranes (C) the presence or absence of ribosomes (D) whether or not the cell carries out cellular metabolism (E) whether or not the cell contains DNA

122、What is the genetic center of the cell?
(A)the nucleolus (B) the nucleus (C) the Golgi apparatus (D) the lysosomes (E) the rough endoplasmic reticulum

123、 What are the primary sites of protein production in a living cell?
(A)the Golgi apparatus (B) ribosomes (C) microbodies (D) mitochondria (E) lysosomes

124、The Golgi apparatus mainly functions to modify
(A)vitamins (B) the nucleolus (C) fatty acids (D) minerals (E) glycoproteins

125、In osmosis, water always moves toward the ____ solution: that is, toward the solution with the ____ solute concentration.
(A)isotonic ... greater (B) hypertonic ... greater (C) hypertonic ... lesser (D) hypotonic ... greater (E) hypotonic ... lesser

126、Which statement best describes phagocytosis?
(A)Cells use this process to export products such as insulin or thyroxine. (B) A cell engulfs a particle by wrapping pseudopodia around it and packaging it within a vacuole. (C) Small droplets of extracellular fluid and all the dissolved solutes enter the cell by this process. (D) Only specific extracellular ligands enter the cell in this fashion. (E) After entry, the endocytotic vesicle migrates to and fuses with the Golgi apparatus.

127、The transport of molecules of a particular solute from inside an animal cell across the cell membrane to the extracellular fluid always requires energy when _____.
(A)the lipid bilayer is permeable to the solute (B) the concentration of the solute is higher inside the cell than outside it (C) the concentration of the solute is lower inside the cell than outside it (D) a transport protein is involved in the movement of the molecules (E) the cytoskeleton blocks all available channels

128、Phospholipid molecules in a membrane are arranged with their ____ on the exterior and their ____ on the interior.
(A)hydrophobic heads ... hydrophilic tails (B) hydrophilic heads ... hydrophobic tails (C) nonpolar heads ... polar tails (D) hydrophobic tails ... hydrophilic heads (E) hydrophilic tails ... hydrophobic heads

129、_____ is used and _____ is produced in the overall process of cellular respiration.
(A)Carbon dioxide ... water (B) Oxygen ... glucose (C) Water ... ATP (D) Glucose ... carbon dioxide (E)ATP ... oxygen

130、The synthesis of ATP by chemiosmosis _____.
(A)is endergonic and is coupled to exergonic electron transport (B) is exergonic and is coupled to endergonic electron transport (C) is due to electrons shuttled down the electron transport chain to the final electron acceptor, which is NAD+ (D) is due to a series of reactions in the cytoplasmic matrix of the mitochondria (E) produces less ATP than the Krebs cycle and glycolysis combined