91135 **120 MINUTES**

1. If two organisms are in the same class, they must also be in the same --------
   A) Kingdom and family B) Kingdom and phylum
   C) Phylum and genus D) Genus and species

2. Most marsupial and all monotreme species, today, are found in:
   A) Central and South America B) Europe
   C) Australia D) Asia

3. Salamander belongs to the Class:
   A) Aves B) Reptilia
   C) Pisces D) Amphibia

4. Pneumatic bone is characteristic of :
   A) Amphioxus B) Fishes
   C) Snakes D) Birds

5. The largest animal ever existed on earth is:
   A) Woolly Mammoth B) Tyrannosaurus
   C) Sulphur-bottom (blue) Whale D) African elephant

6. Which Class has the largest number of animals?
   A) Mammals B) Fishes
   C) Reptiles D) Insects

7. Acoelomates are characterized by
   A) The absence of a brain.
   B) The absence of mesoderm.
   C) A solid body without a cavity surrounding internal organs.
   D) A coelom that is not completely lined with mesoderm.

8. Which of the following characteristics is probably *most* responsible for the great diversification of insects on land?
   A) Segmentation B) Antennae
   C) Exoskeleton D) Bilateral symmetry

9. The water vascular system of echinoderms
   A) Functions as a circulatory system that distributes nutrients to body cells
   B) Functions in locomotion, feeding, and gas exchange
   C) Is bilateral in organization, even though the adult animal is not bilateral symmetrical
   D) Moves water through the animal's body during suspension feeding

10. Vertebrates and tunicates share
   A) Jaws adapted for feeding
   B) A high degree of cephalization
   C) The formation of structures from the neural crest
   D) A notochord and a dorsal, hollow nerve cord

11. Which of the following combinations of phylum and description is *incorrect?*
    A) Echinodermata - bilateral symmetry as a larva, coelom present
    B) Nematoda - roundworms, pseudocoelomate
    C) Platyhelminthes - flatworms, gastrovascular cavity, acoelomate
    D) Calcarea - gastrovascular cavity, coelom present

12. Mammals and living birds share all of the following characteristics *except*
    A) Endothermy
    B) Descent from a common amniotic ancestor
    C) A dorsal, hollow nerve cord
    D) An archosaur common ancestor

13. Which among the following is *not* a model organism in genetic analysis?
    A) The zebra fish
    B) The plant *Arabidopsis thaliana*
    C) The nematode *Caenorhabditis elegans*
    D) The mouse deer

14. A human cell containing 22 autosomes and a Y chromosome is
    A) A sperm B) An egg
    C) A somatic cell of a female D) A somatic cell of a male

15. If the DNA content of a diploid cell in the G1 phase of the cell cycle is x, then the DNA content of the same cell at metaphase of meiosis I would be
    A) 0.25x B) 0.5x C) x D) 2x

16. How many different combinations of maternal and paternal chromosomes can be packaged in gametes made by an organism with a diploid number of 8 (2n = 8)?
    A) 2 B) 4 C) 8 D) 16

17. Homologous chromosomes move toward opposite poles of a dividing cell during
    A) Mitosis B) Meiosis I
    C) Meiosis II D) Fertilization

18. Meiosis II is similar to mitosis in that
    A) Sister chromatids separate during anaphase
    B) DNA replicates before the division
    C) The daughter cells are diploid
    D) Homologous chromosomes synapse

19. Phenylketonuria (PKU) is an inherited disease caused by a recessive allele. If a woman and her husband, who are both carriers, have three children, what is the probability of all three children are of normal phenotype?
    (Note: Remember that the probabilities of all possible outcomes always add up to 1.)
    A) 27/64 B) 37/64 C) 1/64 D) 63/64

20. Down syndrome is usually the result of an extra chromosome ---------- , so that each body cell has a total of 47 chromosomes.
    A) 18 B) 21 C) 13 D) 22

21. A cross between two true breeding lines one with dark blue flowers and one with bright white flowers produces F1 offspring that are light blue. When the F1 progeny are selfed, a 1:2:1 ratio of dark blue to light blue to white flowers is observed. What genetic phenomenon is consistent with these results?
    A) Epistasis
    B) Incomplete dominance
    C) Codominance
    D) Inbreeding depression

22. A gene showing codominance
    A) Has both alleles independently expressed in the heterozygote
    B) Has one allele dominant to the other
    C) Has alleles tightly linked on the same chromosome
    D) Has alleles expressed at the same time in development

23. X-chromosome inactivation
    A) Normally takes place in males but not females
    B) Is the cause of the Y chromosome being genetically inactive
    C) Takes place in humans so that the same X chromosome is inactive in all of the cells of a female
    D) Results in genetically turning off one of the two X chromosomes in female mammals

24. An increase in the inbreeding coefficient, F, is likely to result in:
    A) Reduced likelihood of heterozygotes being present in a population
    B) Higher proportion of genes that show linkage
    C) Higher proportion of genes with introns
    D) Lower level of difference between proteins in two daughter cells

25. RFLP analysis is a technique that
    A) Uses hybridization to detect specific DNA restriction fragments in genomic DNA
    B) Is used to determine whether a gene is transcribed in specific cells
    C) Measures the transfer frequency of genes during conjugation
    D) Is used to detect genetic variation at the protein level.

26. The polymerase chain reaction or PCR is a technique that
    A) Was used to demonstrate DNA as the genetic material
    B) Is used to determine the content of minerals in a soil sample
    C) Uses short DNA primers and a thermostable DNA polymerase to replicate specific DNA sequences in vitro.
    D) Measures the ribosome transfer rate during translation

27. Positional cloning refers to:
    A) Using a selection procedure to clone a cDNA
    B) Cloning a portion of a gene using PCR
    C) Isolating a gene by PCR using primers from another species
    D) Mapping a gene to a chromosomal region and then identifying and cloning a genomic copy of the gene from the region

28. Large quantities of useful products can be produced through genetic engineering involving:
    A) Bacteria containing recombinant plasmids
    B) Yeast carrying foreign genes
    C) Transgenic plants
    D) All of the above

29. On average, how many fragments would a restriction enzyme which recognizes a specific 4 base sequence in DNA be expected to cleave a double-stranded bacteriophage with a genome size of 5,000 bp into?
    A) About 2 B) About 4
    C) About 20 D) About 1250

30. QTL analysis is used to:
    A) Identify RNA polymerase binding sites
    B) Map genes in bacterial viruses
    C) Determine which genes are expressed at a developmental stage
    D) Identify chromosome regions associated with a complex trait in a genetic cross

31. Simple tandem repeat polymorphisms in humans are most useful for:
    A) Solving criminal and paternity cases
    B) Reconstructing the relationships of humans and chimps.
    C) Estimating relationships of humans and Neanderthals
    D) Transferring disease resistance factors into bone marrow cells

32. Mitochondrial DNA is advantageous for evolutionary studies because:
    A) It is inherited only through the female parent and thus evolves in a way that allows trees of relationship to be easily constructed
    B) It is inserted into the X chromosome
    C) It first appeared in humans and is not found in other animals
    D) It evolves more slowly than the genes in the nucleus

33. Twin studies in humans are useful because:
    A) They allow more refined estimates of chromosome location to be made
    B) Twins have a greater likelihood of being heterozygous
    C) They allow improved expression of genes
    D) They allow genetic as opposed to environmental influences on variation in a trait to be estimated

34. Choose the correct statements about the most common structure of DNA
    (1) The two strands are paired by hydrogen bonds between the bases, with A pairing with T, and G pairing with C
    (2) The two strands run in opposite orientations (one 5'-3', one 3'-5') with respect to each other
    (3) Backbone consists of alternating sugars and phosphate groups.
    A) 1, 2, 3 B) 1, 2 C) 1, 3 D) 2, 3

35. The process of DNA replication involves:
    A) Multiple origins of replication per chromosome in eukaryotes
    B) Binding of ribosomes to origins of replication
    C) Continuous synthesis on both strands of the double helix
    D) Conservative replication, with one original double helix and one totally new double helix as products

36. Which of the following is NOT a property of the genetic code:
    A) Non-overlapping B) Redundant
    C) Almost universal D) Four stop codons

37. Which of the following are similar between transcription in prokaryotes and eukaryotes?
    A) RNA polymerases produce mRNAs which grow in the 5' to 3' direction
    B) RNA polymerases bind to ribosomes to allow transcription
    C) A poly A tail is added to the 3' end of messenger RNAs
    D) Introns are present in genes which are spliced out after transcription

38. Translation involves:
    A) Mapping genes in bacteria using a viral carrier
    B) Reading an mRNA to yield an amino acid sequence in a protein
    C) Taking up DNA into a cell and changing its genetic makeup
    D) Reading a DNA strand and making an mRNA copy

39. Gene duplication is thought to have been important in evolution because:
    A) Fewer copies of genes allows more rapid DNA replication
    B) Changing in the position of genes usually changes their expression
    C) An extra copy of a gene can sometimes undergo adaptive changes while the first copy continues to serve its original function
    D) Introns represent much of the extra DNA found in eukaryotes

40. The normal function of a promoter is to:
    A) Bind the small subunit of the ribosome
    B) Serve as an origin of DNA replication
    C) Serve as an acceptor for transfer RNA
    D) Serve as a binding site for RNA polymerase

41. Which of the following pairs of base sequences could form a short stretch of a normal double helix of DNA?
    A) 5'-purine-pyrimidine-purine-pyrimidine-3' with 3'-purine-pyrimidine-purine- pyrimidine-5'
    B) 5'-AGCT-3' with 5'-TCGA-3'
    C) 5'-GCGC-3' with 5'-TATA-3'
    D) 5'-ATGC-3' with 5'-GCAT-3'

42. Enzymes that break down DNA catalyze the hydrolysis of the covalent bonds that join nucleotides together. What would happen to DNA molecules treated with these enzymes?
    A) The two strands of the double helix would separate
    B) The phosphodiester linkages between deoxyribose sugars would be broken
    C) The purines would be separated from the deoxyribose sugars
    D) The pyrimidines would be separated from the deoxyribose sugars

43. Which structure is not part of the endomembrane system?
    A) Nuclear envelope
    B) Chloroplast
    C) Golgi apparatus
    D) Plasma membrane

44. Which structure-function pair is mismatched?
    A) Nucleolus - production of ribosomal subunits
    B) Lysosome - intracellular digestion
    C) Golgi -protein trafficking
    D) Microtubule - muscle contraction

45. Cells of the pancreas will incorporate radioactively labeled amino acids into proteins. This "tagging'' of newly synthesized proteins enables a researcher to track their location. In this case, we are tracking an enzyme secreted by pancreatic cells. What is its most likely pathway?
    A) ER--->Golgi--->nucleus
    B) Golgi--->ER--->Iysosome
    C) Nuc1eus--->ER--->Golgi
    D) ER--->Golgi--->vesicles that fuse with plasma membrane

46. Cyanide binds with at least one molecule involved in producing ATP. If a cell is exposed to cyanide, most of the cyanide would be found within the
    A) Mitochondria B) Ribosomes
    C) Peroxisomes D) Lysosomes

47. In what way do the membranes of a eukaryotic cell vary?
    A) Phospholipids are found only in certain membranes
    B) Certain proteins are unique to each membrane
    C) Only certain membranes of the cell are selectively permeable
    D) Only certain membranes are constructed from amphipathic molecules

48. According to the fluid mosaic model of membrane structure, proteins of the membrane are mostly
    A) Spread in a continuous layer over the inner and outer surfaces of the membrane
    B) Confined to the hydrophobic core of the membrane
    C) Embedded in a lipid bilayer
    D) Randomly oriented in the membrane, with no fixed inside outside polarity

49. Which of the following factors would tend to increase membrane fluidity?
    A) A greater proportion of unsaturated phospholipids
    B) A greater proportion of saturated phospholipids
    C) A lower temperature
    D) A relatively high protein content in the membrane

50. Which of the following processes includes all others?
    A) Osmosis
    B) Diffusion of a solute across a membrane
    C) Facilitated diffusion
    D) Passive transport

51. Which of the following conditions is caused by a trinucleotide (triplet) repeat expansion?
    A) Cystic fibrosis
    B) Duchenne muscular dystrophy
    C) Huntington disease
    D) Osteogenesis imperfecta

52. In DNA, adenine normally pairs with:
    A) Cytosine B) Guanine C) Thymine D) Uracil

53. The Nobel Prize in Physiology or Medicine 1962 was awarded jointly to Francis Harry Compton Crick, James Dewey Watson and ----------*"for their discoveries concerning the molecular structure of nucleic acids and its significance for information transfer in living material"*.
    A) Maurice Hugh Frederick Wilkins
    B) Rosalind Franklin
    C) Frederick Sanger
    D) Erwin Chargaff

54. Which component of transcribed RNA in eukaryotes is present in the initial transcript but is removed before translation occurs?
    A) Intron B) 3’ Poly A tail
    C) Ribosome binding site D) 5’ cap

55. Choose the pair of terms that correctly completes this sentence:
    Catabolism is to anabolism as ---------- is to ----------
    A) Exergonic; spontaneous B) Exergonic; endergonic
    C) Free energy; entropy D) Work; energy

56. Most cells cannot harness heat to perform work because
    A) Heat is not a form of energy
    B) Cells do not have much heat; they are relatively cool
    C) Temperature is usually uniform throughout a cell
    D) Heat can never be used to do work

57. Which of the following metabolic processes can occur without a net influx of energy from some other process?
    A) ADP +Pi ---> ATP + H_2O
    B) $C_6H_{12}O_6 + 6O_2$---> $6\ CO_2 + 6\ H_2O$
    C) $6CO_2 + 6\ H_2O$---> $C_6H_{12}O_6 + 6O_2$
    D) Amino acids ---> protein

58. If an enzyme in solution is saturated with substrate, the most effective way to obtain a faster yield of products is to
    A) Add more of the enzyme
    B) Heat the solution to 9O°C
    C) Add more substrate
    D) Add an allosteric inhibitor

59. If an enzyme is added to a solution where its substrate and product are in equilibrium, what would occur?
    A) Additional product would be formed
    B) Additional substrate would be formed
    C) The reaction would change from endergonic to exergonic
    D) Nothing; the reaction would stay at equilibrium

60. Some bacteria are metabolically active in hot springs because
    A) They are able to maintain a lower internal temperature
    B) High temperatures make catalysis unnecessary
    C) Their enzymes have high optimal temperatures
    D) Their enzymes are completely insensitive to temperature

61. What is the reducing agent in the following reaction?
    Pyruvate + NADH + H^+ --> Lactate + NAD^+
    A) Oxygen
    B) NADH
    C) NAD^+
    D) Lactate

62. The immediate energy source that drives ATP synthesis by ATP synthase during oxidative phosphorylation is the
    A) Oxidation of glucose and other organic compounds
    B) Flow of electrons down the electron transport chain
    C) Affinity of oxygen for electrons
    D) H^+ concentration across the membrane holding ATP synthase

63. Which metabolic pathway is common to both fermentation and cellular respiration of a glucose molecule?
    A) The citric acid cycle
    B) The electron transport chain
    C) Glycolysis
    D) Synthesis of acetyl CoA from pyruvate

64. In mitochondria, exergonic redox reactions
    A) Are the source of energy driving prokaryotic ATP synthesis
    B) Are directly coupled to substrate-level phosphorylation
    C) Provide the energy that establishes the proton gradient
    D) Reduce carbon atoms to carbon dioxide

65. The final electron acceptor of the electron transport chain that functions in aerobic oxidative phosphorylation is
A) Oxygen B) Water
C) NAD^+ D) Pyruvate

66. When electrons flow along the electron transport chains of mitochondria, which of the following changes occurs?
A) The pH of the matrix increases
B) ATP synthase pumps protons by active transport
C) The electrons gain free energy
D) The cytochromes phosphorylate ADP to form ATP

67. Compared with a smaller cell, a larger cell of the same shape has
A) Less surface area
B) Less surface area per unit of volume
C) The same surface-to-volume ratio
D) A smaller average distance between its mitochondria and the external source of oxygen

68. The epithelium lining of the digestive tract of humans is:
A) Simple squamous B) Simple cuboidal
C) Simple columnar D) Stratified squamous

69. Which of the following is not an adaptation for reducing the rate of heat exchange between an animal and its environment?
A) Feathers or fur B) Vasoconstriction
C) Nonshivering thermogenesis D) Countercurrent heat exchanger

70. Which of the following animals uses the highest percent of its energy budget for homeostatic regulation?
A) a hydra B) a marine jelly (an invertebrate)
C) a desert bird D) a snake in a temperate forest

71. An animal's inputs of energy and materials would exceed its outputs
A) If the animal is an endotherm, which must always take in more energy because of its high metabolic rate
B) If it is actively foraging for food.
C) If it is hibernating
D) If it is growing and increasing its mass

72. Which of the following animals is incorrectly paired with its feeding mechanism?
A) Lion-substrate feeder B) Baleen whale-suspension feeder
C) Aphid-fluid feeder D) Snake-bulk feeder

73. The mutualistic microorganisms that help nourish a ruminant live mainly in specialized regions of the
A) Large intestine B) Liver
C) Stomach D) Small intestine

74. When you hold your breath, which of the following blood gas changes first leads to the urge to breathe?
A) Rising O_2
B) Falling O_2
C) Rising CO_2
D) Rising CO_2 and falling O_2

75. Blood returning to the mammalian heart in a pulmonary vein drains first into the
A) Vena cava
B) Left atrium
C) Right atrium
D) Left ventricle

76. Unlike an earthworm's metanephridia, a mammalian nephron
A) Is intimately associated with a capillary network
B) Forms urine by changing fluid composition inside a tubule
C) Functions in both osmoregulation and excretion
D) Receives filtrate from blood instead of coelomic fluid

77. A distinctive feature of the mechanism of action of thyroid hormones and steroid hormones is that
A) These hormones are regulated by feedback loops
B) Target cells react more rapidly to these hormones than to local regulators
C) These hormones bind with specific receptor proteins on the plasma membrane of target cells
D) These hormones bind to receptors inside cells

78. The pacemaker of the heart is normally the
A) Sinoatrial node
B) Atrioventricular node
C) Mitral valve
D) Bundle of His

79. Which of these is *not* part of insect immunity?
A) Enzyme activation of microbe-killing chemicals
B) Activation of natural killer cells
C) Phagocytosis by hemocytes
D) Production of antimicrobial peptides

80. What is a characteristic of early stages of local inflammation?
A) Anaphylactic shock
B) Fever
C) Attack by cytotoxic T cells
D) Release of histamine

81. An epitope associates with which part of an antibody?
A) The antibody-binding site
B) The heavy-chain constant regions only
C) Variable regions of a heavy chain and light chain combined
D) The light-chain constant regions only

82. Which of the following is not true about helper T cells?
A) They function in cell-mediated and humoral responses
B) They are activated by polysaccharide fragments
C) They bear surface CD4 molecules
D) They are subject to infection by HIV

83. Which statement best describes the difference in responses of effector B cells (plasma cells) and cytotoxic T cells?
    A) B cells confer active immunity; cytotoxic T cells confer passive immunity
    B) B cells kill viruses directly; cytotoxic T cells kill virus infected cells
    C) B cells secrete antibodies against a virus; cytotoxic T cells kill virus-infected cells
    D) B cells accomplish the cell-mediated response; cytotoxic T cells accomplish the humoral response

84. Which of the following results in long-term immunity?
    A) The passage of maternal antibodies to a developing fetus
    B) The inflammatory response to a splinter
    C) The injection of serum from people immune to rabies
    D) The administration of the chicken pox vaccine

85. HIV targets include all of the following except
    A) Macrophages B) Cytotoxic T cells
    C) Helper T cells D) Cells bearing CD4

86. An ECG would be useful for determining a patient's
    A) Heart murmur.
    B) Stroke volume
    C) Cardiac output
    D) Blockage of conduction of electrical signals between the atria and the ventricles

87. During exercise, there is an increased flow of blood to
    A) The brain B) The kidneys
    C) The skin D) B and C

88. Which of the following tissues is most dependent upon a constant blood supply of glucose?
    A) Liver B) Brain
    C) Adipose tissue D) Skeletal muscle

89. John is a sprinter who specialises in quick and powerful bursts of speed followed by periods of rest. Jim is a marathon runner who specializes in long, steady runs. Compared to Jim, John is likely to have
    A) Legs with a larger diameter
    B) Legs with a smaller diameter
    C) Hypertrophy of type I muscle fibres
    D) A and C

90. Which of the following metabolic pathways does not require oxygen?
    A) Glycolysis
    B) Oxidative phosphorylation
    C) The Krebs cycle
    D) The breakdown of fatty acids to CO_2 and H_2O

91. The cortical reaction of sea urchin eggs functions directly in
    A) The formation of a fertilization envelope
    B) The production of a fast block to polyspermy
    C) The release of hydrolytic enzymes from the sperm
    D) The generation of an electrical impulse by the egg

92. Which of the following is common to the development of both birds and mammals?
    A) Holoblastic cleavage
    B) Epiblast and hypoblast
    C) Trophoblast
    D) Yolk plug

93. The archenteron develops into
    A) The mesoderm
    B) The blastocoel
    C) The endoderm
    D) The lumen of the digestive tract

94. In a frog embryo, the blastocoel is
    A) Completely obliterated by yolk
    B) Lined with endoderm during gastrulation
    C) Located in the animal hemisphere
    D) The cavity that becomes the coelom

95. Which of the following areas of study focuses on the exchange of energy, organisms, and materials between ecosystems?
    A) Population ecology
    B) Organismal ecology
    C) Landscape ecology
    D) Ecosystem ecology

96. The oceans affect the biosphere in all of the following ways *except*
    A) Producing a substantial amount of the biosphere's oxygen
    B) Removing carbon dioxide from the atmosphere
    C) Moderating the climate of terrestrial biomes
    D) Regulating the pH of freshwater biomes and terrestrial groundwater

97. Which lake zone would be absent in a very shallow lake?
    A) Benthic zone
    B) Euphotic zone
    C) Pelagic zone
    D) Littoral zone

98. Which of the following is *true* with respect to eutrophic lakes?
    A) Increased dissolved oxygen during night
    B) Increase in biodiversity
    C) Eutrophic lake water contains lower concentrations of nutrients
    D) Eutrophic lakes are richer in nutrients

99. Which of the following is characteristic of most terrestrial biomes?
    A) Annual average rainfall in excess of 250 cm
    B) A distribution predicted almost entirely by rock and soil patterns
    C) Clear boundaries between adjacent biomes
    D) Vegetation demonstrating stratification

100. Which of the following biomes is *correctly* paired with the description of its climate?
    A) Savanna-low temperature, precipitation uniform during the year
    B) Tundra-long summers, mild winters
    C) Temperate grasslands-relatively warm winters, most rainfall in summer
    D) Tropical forests-nearly constant day length and temperature

101. During exponential growth, a population always
    A) Grows by thousands of individuals
    B) Grows at its maximum per capita rate
    C) Slowly reaches its carrying capacity
    D) Cycles through time

102. Keystone predators can maintain species diversity in a community if they
    A) Competitively exclude other predators
    B) Prey on the community's dominant species
    C) Allow immigration of other predators
    D) Reduce the number of disruptions in the community

103. Which of the following organisms is *incorrectly* paired with its trophic level?
    A) Cyanobacterium-primary producer
    B) Grasshopper-primary consumer
    C) Zooplankton-primary producer
    D) Eagle-tertiary consumer

104. Which of these ecosystems has the *lowest* net primary production per square meter?
    A) Tropical rain forest
    B) Salt marsh
    C) A coral reef
    D) A grassland

105. What is the single greatest threat to biodiversity?
    A) Overexploitation of commercially important species
    B) Introduced species that compete with or prey on native species
    C) Disruption of trophic relationships as more and more prey species become extinct
    D) Habitat alteration, fragmentation, and destruction

106. Of the following statements about protected areas that have been established to preserve biodiversity, which one is *not* correct?
    A) About 25% of Earth's land area is now protected
    B) National parks are one of many types of protected areas
    C) Most protected areas are too small to protect species
    D) Management of a protected area should be coordinated with management of the land surrounding the area

107. The upper forelimbs of humans and bats have fairly similar skeletal structures, whereas the corresponding bones in whales have very different shapes and proportions. However, genetic data suggest that all three kinds of organisms diverged from a common ancestor at about the same time. Which of the following is the most likely explanation for these data?
    A) Humans and bats evolved by natural selection, and whales evolved by Lamarckian mechanisms
    B) Forelimb evolution was adaptive in people and bats, but not in whales
    C) Natural selection in an aquatic environment resulted in significant changes to whale forelimb anatomy
    D) Genes mutate faster in whales than in humans or bats

108. DNA sequences in many human genes are very similar to the sequences of corresponding genes in chimpanzees. The most likely explanation for this result is that
    A) Humans and chimpanzees share a relatively recent common ancestor
    B) Humans evolved from chimpanzees
    C) Chimpanzees evolved from humans
    D) Convergent evolution led to the DNA similarities

109. Natural selection changes allele frequencies because some ---------- survive and reproduce more successfully than others.
    A) Alleles B) Gene pools
    C) Individuals D) Species

110. The largest unit within which gene flow can readily occur is a
    A) Population B) Species
    C) Genus D) Hybrid

111. According to the punctuated equilibria model,
    A) Natural selection is unimportant as a mechanism of evolution
    B) Given enough time, most existing species will branch gradually into new species
    C) Most new species accumulate their unique features relatively rapidly as they come into existence, then change little for the rest of their duration as a species
    D) Most evolution occurs in sympatric populations

112. The study of human origins is known as ----------
    A) Paleoanthropology B) Paleozoology
    C) Archaebiology D) Paleontology

113. Fossil evidence indicates that the ancestors of humans originated in ---------
    A) Asia B) Africa
    C) South America D) North America

114. Lemurs are found only in ----------
    A) Australia B) Indonesian Islands
    C) Madagascar D) the Himalayas

115. The Western Ghats stretch along the west-coast of peninsular India for about ----------

A) 2100 km B) 1600 km
C) 1100 km D) 1900 km

116. Female spotted sandpipers aggressively court males and, after mating, leave the clutch of young for the male to incubate. This sequence may be repeated several times with different males until no available males remain, forcing the female to incubate her last clutch. Which of the following terms best describes this behavior?

A) Monogamy B) Polygyny
C) Polyandry D) Promiscuity

117. According to Hamilton's rule,

A) Natural selection does not favor altruistic behavior that causes the death of the altruist
B) Natural selection favors altruistic acts when the resulting benefit to the beneficiary, correct for relatedness, exceeds the cost to the altruist
C) Natural selection is more likely to favor altruistic behavior that benefits an offspring than altruistic behavior that benefits a sibling
D) The effects of kin selection are larger than the effects of direct natural selection on individuals

118. *Leptocorisa varicornis* is a pest of ----------

A) Rice B) Tobacco
C) Brinjal D) Potato

119. ---------- is the largest exporter of ornamental fishes in the world.

A) Africa B) Europe
C) Asia D) Australia

120. *Pinctada fucata* is associated with ----------

A) Pearl culture B) Sericulture
C) Apiculture D) Fish culture

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