

亞洲大學

106 學年度學士後獸醫學系招生考試試題紙

學系別	考試科目	考試日期	時 間
學士後獸醫學系	生物學(含動物、植物)		15:40-17:20
<p>1. Through time, the lineage that led to modern whales shows a change from four-limbed land animals to aquatic animals with two limbs that function as flippers. This change is best explained by</p> <p>A). natural philosophy B). creationism C). the hierarchy of the biological organization of life D). natural selection</p> <p>2. The molecular formula for glucose is $C_6H_{12}O_6$. What would be the molecular formula for a molecule made by linking three glucose molecules together by dehydration reactions?</p> <p>A). $C_{18}H_{36}O_{18}$ B). $C_{18}H_{30}O_{15}$ C). $C_6H_{10}O_5$ D). $C_{18}H_{10}O_{15}$</p> <p>3. Large numbers of ribosomes are present in cells that specialize in producing which of the following molecules?</p> <p>A). lipids B). starches C). proteins D). steroids</p> <p>4. The presence of cholesterol in the plasma membranes of some animals</p> <p>A). enables the membrane to stay fluid more easily when cell temperature drops B). enables the animal to remove hydrogen atoms from saturated phospholipids C). enables the animal to add hydrogen atoms to unsaturated phospholipids D). makes the membrane less flexible, allowing it to sustain greater pressure from within cell</p> <p>5. Water passes quickly through cell membranes because</p> <p>A). the bilayer is hydrophilic B). it moves through hydrophobic channels C). water movement is tied to ATP hydrolysis D). it moves through aquaporins in the membrane</p>			

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<p>6. When ATP releases some energy, it also releases inorganic phosphate. What purpose does this serve (if any) in the cell?</p> <p>A). It is released as an excretory waste B). It can only be used to regenerate more ATP C). It can be added to water and excreted as a liquid D). It can be added to other molecules in order to activate them</p> <p>7. The oxygen consumed during cellular respiration is involved directly in which process or event?</p> <p>A). glycolysis B). accepting electrons at the end of the electron transport chain C). the citric acid cycle D). the phosphorylation of ADP to form ATP</p> <p>8. Which metabolic pathway is common to both cellular respiration and fermentation?</p> <p>A). the oxidation of pyruvate to acetyl CoA B). the citric acid cycle C). oxidative phosphorylation D). glycolysis</p> <p>9. From the perspective of the cell receiving the message, the three stages of cell signaling are</p> <p>A). the paracrine, local, and synaptic stages B). signal reception, signal transduction, and cellular response C). signal reception, nucleus disintegration, and new cell generation D). the alpha, beta, and gamma stages</p> <p>10. Which of the following are chemical messengers that pass through the plasma membrane of cells and have receptor molecules in the cytoplasm?</p> <p>A). insulin B). testosterone C). cAMP D). epinephrine</p>			

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<p>11. Testosterone functions inside a cell by</p> <p>A). acting as a signal receptor that activates ion-channel proteins</p> <p>B). binding with a receptor protein that enters the nucleus and activates specific genes</p> <p>C). acting as a steroid signal receptor that activates ion-channel proteins</p> <p>D). becoming a second messenger that inhibits adenylyl cyclase</p> <p>12. If cells in the process of dividing are subjected to colchicine, a drug that interferes with the functioning of the spindle apparatus, at which stage will mitosis be arrested?</p> <p>A). anaphase</p> <p>B). prophase</p> <p>C). telophase</p> <p>D). metaphase</p> <p>13. Which of the following is a protein synthesized at specific times during the cell cycle that associates with a kinase to form a catalytically active complex?</p> <p>A). PDGF</p> <p>B). MPF</p> <p>C). protein kinase</p> <p>D). cyclin</p> <p>14. The decline of MPF activity at the end of mitosis is due to</p> <p>A). the destruction of the protein kinase Cdk</p> <p>B). decreased synthesis of cyclin</p> <p>C). the degradation of cyclin</p> <p>D). synthesis of DNA</p> <p>15. Chiasmata are what we see under a microscope that let us know which of the following is occurring?</p> <p>A). Asexual reproduction</p> <p>B). Meiosis II</p> <p>C). Anaphase II</p> <p>D). Crossing over</p>			

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<p>16. Homologous chromosomes move toward opposite poles of a dividing cell during</p> <p>A). mitosis B). meiosis I C). meiosis II D). fertilization</p> <p>17. How many unique gametes could be produced through independent assortment by an individual with the genotype $AaBbCCDdEE$?</p> <p>A). 4 B). 8 C). 16 D). 32</p> <p>18. When crossing an organism that is homozygous recessive for a single trait with a heterozygote, what is the chance of producing an offspring with the homozygous recessive phenotype?</p> <p>A). 0% B). 25% C). 50% D). 75%</p> <p>19. What is the chromosomal system for determining sex in mammals?</p> <p>A). X-0 B). X-X C). X-Y D). Z-W</p> <p>20. What is the chromosomal system for sex determination in birds?</p> <p>A). X-0 B). X-X C). X-Y D). Z-W</p>			

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<p>21. What kind of chemical bond is found between paired bases of the DNA double helix?</p> <p>A). hydrogen B). ionic C). covalent D). sulfhydryl</p> <p>22. What is the function of DNA polymerase III?</p> <p>A). to unwind the DNA helix during replication B). to seal together the broken ends of DNA strands C). to add nucleotides to the end of a growing DNA strand D). to degrade damaged DNA molecules</p> <p>23. Using RNA as a template for protein synthesis instead of translating proteins directly from the DNA is advantageous for the cell because</p> <p>A). RNA is much more stable than DNA B). RNA acts as an expendable copy of the genetic material C). only one mRNA molecule can be transcribed from a single gene, lowering the potential rate of gene expression D). tRNA, rRNA and others are not transcribed</p> <p>24. In eukaryotes there are several different types of RNA polymerase. Which type is involved in transcription of mRNA for a globin protein?</p> <p>A). ligase B). RNA polymerase I C). RNA polymerase II D). RNA polymerase III</p> <p>25. Muscle cells and nerve cells in one species of animal owe their differences in structure to</p> <p>A). having different genes B). having different chromosomes C). using different genetic codes D). having different genes expressed</p>			

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<p>26. If you were to observe the activity of methylated DNA, you would expect it to</p> <p>A). be replicating nearly continuously</p> <p>B). be unwinding in preparation for protein synthesis</p> <p>C). have turned off or slowed down the process of transcription</p> <p>D). be very actively transcribed and translated</p> <p>27. What is bioinformatics?</p> <p>A). a technique using 3D images of genes in order to predict how and when they will be expressed</p> <p>B). a method that uses very large national and international databases to access and work with sequence information</p> <p>C). a software program available from NIH to design genes</p> <p>D). a series of search programs that allow a student to identify who in the world is trying to sequence a given species</p> <p>28. What is proteomics?</p> <p>A). the linkage of each gene to a particular protein</p> <p>B). the study of the full protein set encoded by a genome</p> <p>C). the totality of the functional possibilities of a single protein</p> <p>D). the study of how amino acids are ordered in a protein</p> <p>29. Ichthyosaurs were aquatic dinosaurs. Fossils show us that they had dorsal fins and tails, as do fish, even though their closest relatives were terrestrial reptiles that had neither dorsal fins nor aquatic tails. The dorsal fins and tails of ichthyosaurs and fish are</p> <p>A). homologous</p> <p>B). examples of convergent evolution</p> <p>C). adaptations to a common environment</p> <p>D). B and C only</p> <p>30. Which of these is the smallest unit upon which natural selection directly acts?</p> <p>A). a species' gene frequency</p> <p>B). a population's gene frequency</p> <p>C). an individual's genome</p> <p>D). an individual's phenotype</p>			

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<p>31. Theoretically, the production of sterile mules by interbreeding between female horses and male donkeys should</p> <p>A). result in the extinction of one of the two parental species B). cause convergent evolution C). strengthen postzygotic barriers between horses and donkeys D). weaken the intrinsic reproductive barriers between horses and donkeys</p> <p>32. A swim bladder is a gas-filled sac that helps fish maintain buoyancy. The evolution of the pattern is</p> <p>A). an evolutionary trend B). paedomorphosis C). exaptation D). adaptive radiation</p> <p>33. Which of these illustrates the correct representation of the binomial scientific name for the African lion?</p> <p>A). <i>Panthera leo</i> B). panthera leo C). <i>Panthera leo</i> D). <i>Panthera leo</i></p> <p>34. Which of the following terms or structures is properly associated only with animals?</p> <p>A). <i>Hox</i> genes B). cell wall C). autotrophy D). chitin</p> <p>35. The last common ancestor of all animals was probably a</p> <p>A). unicellular chytrid B). unicellular yeast C). plant D). flagellated protist</p>			

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<p>36. Which cells in a sponge are primarily responsible for trapping and removing food particles from circulating water?</p> <p>A). choanocytes B). mesoglea cells C). pore cells (porocytes) D). epidermal cells</p> <p>37. What would be the most effective method of reducing the incidence of blood flukes in a human population?</p> <p>A). Reduce the mosquito population B). Reduce the freshwater snail population C). Purify all drinking water D). Avoid contact with rodent droppings</p> <p>38. A radula is present in members of which class(es)?</p> <p>A). chitons B). bivalves C). gastropods D). cephalopods</p> <p>39. Which of the following are characteristics of arthropods?</p> <ol style="list-style-type: none">1. protostome development.2. bilateral symmetry3. a pseudocoelom4. three embryonic germ layers5. a closed circulatory system s <p>A). 1 and 2 B). 2 and 3 C). 1,2, and 4 D). 2,3 and 5</p>			

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<p>40. Protostomes that have an open circulatory system and an exoskeleton of chitin are part of which phylum?</p> <p>A). Cnidaria B). Annelida C). Mollusca D). Arthropoda</p> <p>41. Deuterostomes that have an endoskeleton are part of which phylum?</p> <p>A). Cnidaria B). Annelida C). Mollusca D). Echinodermata</p> <p>42. Which of the following is a shared characteristic of all chordates?</p> <p>A). scales B). jaws C). vertebrae D). dorsal, hollow nerve cord</p> <p>43. In which of these extant classes did jaws occur earliest?</p> <p>A). lampreys B). chondrichthyans C). ray-finned fishes D). lungfishes</p> <p>44. Which of these is <i>not</i> considered an amniote?</p> <p>A). amphibians B). nonbird reptiles C). birds D). egg-laying mammals</p>			

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<p>45. Which of the following are the only extant animals that descended directly from dinosaurs?</p> <p>A). lizards B). crocodiles C). snakes D). birds</p> <p>46. May have lungs, or gills, and may use skin as a respiratory surface</p> <p>A). amphibians B). nonbird reptiles C). chondrichthyans D). birds</p> <p>47. Interstitial fluid</p> <p>A). is the fluid inside the gastrovascular cavity of <i>Hydra</i> B). is the internal environment found inside an animal's cells C). is composed of blood D). provides for the exchange of materials between blood and body cells</p> <p>48. The fibers responsible for the elastic resistance properties of tendons are</p> <p>A). elastin fibers B). fibrin fibers C). collagenous fibers D). reticular fibers</p> <p>49. Fibroblasts secrete</p> <p>A). fats B). chondroitin sulfate C). interstitial fluids D). proteins for connective fibers</p>			

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<p>50. Food moves along the digestive tract as the result of contractions by</p> <p>A). cardiac muscles B). smooth muscles C). voluntary muscles D). striated muscles</p> <p>51. The body's automatic tendency to maintain a constant internal environment is termed</p> <p>A). balanced equilibrium B). physiological chance C). homeostasis D). static equilibrium</p> <p>52. Endothermy</p> <p>A). is a characteristic of most animals B). involves production of heat through metabolism C). is a term equivalent to "cold-blooded" D). is only seen in mammals</p> <p>53. The temperature-regulating center of vertebrate animals is located in the</p> <p>A). medulla oblongata B). thyroid gland C). hypothalamus D). subcutaneous layer of the skin</p> <p>54. Which of the following is a fat-soluble vitamin?</p> <p>A). vitamin A B). vitamin B₁₂ C). vitamin C D). iodine</p> <p>55. Which of the following minerals is associated with its use in animals?</p> <p>A). calcium construction and maintenance of bone B). magnesium cofactor in enzymes that make ATP C). iron necessary for thyroid function D). sulfur ingredient of nucleic acids</p>			

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<p>56. Folic acid supplements have become especially important for pregnant women. Why?</p> <p>A). Folic acid supplies vitamins that pregnant women lose</p> <p>B). The folic acid stored by pregnant women is removed from their circulation</p> <p>C). The fetus makes high levels of folic acid</p> <p>D). Folic acid deprivation is associated with neural tube abnormalities in a fetus</p> <p>57. Intracellular digestion of peptides is usually immediately preceded by which process?</p> <p>A). hydrolysis</p> <p>B). endocytosis</p> <p>C). absorption</p> <p>D). elimination</p> <p>58. Which of the following statements describes pepsin?</p> <p>A). It is manufactured by the pancreas</p> <p>B). It helps stabilize fat-water emulsions</p> <p>C). It splits maltose into monosaccharides</p> <p>D). It begins the hydrolysis of proteins in the stomach</p> <p>59. Which of the following is true of bile salts?</p> <p>A). They are enzymes</p> <p>B). They are manufactured by the pancreas</p> <p>C). They emulsify fats in the duodenum</p> <p>D). They increase the efficiency of pepsin action</p> <p>60. Which of the following hormone actions will occur when more energy is required by a human?</p> <p>A). Blood insulin increases</p> <p>B). Blood glucagon increases</p> <p>C). Both insulin and glucagon increase</p> <p>D). Both insulin and glucagon decrease</p>			

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<p>61. In which animal does blood flow from the pulmocutaneous circulation to the heart before circulating through the rest of the body?</p> <p>A). annelid B). mollusc C). fish D). frog</p> <p>62. Breathing is usually regulated by</p> <p>A). erythropoietin levels in the blood B). the concentration of red blood cells C). hemoglobin levels in the blood D). CO₂ and O₂ concentration and pH-level sensors</p> <p>63. Blood returning to the mammalian heart in a pulmonary vein drains first into the</p> <p>A). vena cava B). left atrium C). right atrium D). left ventricle</p> <p>64. Pulse is a direct measure of</p> <p>A). blood pressure B). stroke volume C). cardiac output D). heart rate</p> <p>65. The conversion of fibrinogen to fibrin</p> <p>A). occurs when fibrinogen is released from broken platelets B). occurs within red blood cells C). is linked to hypertension and may damage artery walls D). is likely to occur too often in an individual with hemophilia</p>			

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<p>66. Both the eye and the respiratory tract are protected against infections by which of the following?</p> <p>A). the mucous membranes that cover their surface B). the secretion of complement proteins C). the release of slightly acidic secretions D). the secretion of lysozyme onto their surface</p> <p>67. Which action below is affected by an antihistamine?</p> <p>A). blood vessel dilation B). phagocytosis of antigens C). MHC presentation by macrophages D). the secondary immune response</p> <p>68. Septic shock, a systemic response including high fever and low blood pressure, can be life threatening. What causes septic shock?</p> <p>A). certain bacterial infections B). specific forms of viruses C). the presence of natural killer cells D). a fever of >103 degrees in adults</p> <p>69. What are antigens?</p> <p>A). proteins found in the blood that cause foreign blood cells to clump B). proteins embedded in B cell membranes C). proteins that consist of two light and two heavy polypeptide chains D). foreign molecules that trigger the generation of antibodies</p> <p>70. The MHC is important in a T cell's ability to</p> <p>A). distinguish self from nonself B). recognize specific parasitic pathogens C). identify specific bacterial pathogens D). identify specific viruses</p>			

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<p>71. These cells are involved in cell-mediated immunity and destroy virally infected cells:</p> <p>A). cytotoxic T cells B). natural killer cells C). helper T cells D). macrophages</p> <p>72. These cells are involved in cell-mediated immunity, and they respond to class I MHC molecule-antigen complexes:</p> <p>A). cytotoxic T cells B). natural killer cells C). helper T cells D). macrophages</p> <p>73. These cells are involved in innate immunity, and a person lacking these cells may have a higher than normal chance of developing malignant tumors:</p> <p>A). cytotoxic T cells B). natural killer cells C). helper T cells D). macrophages</p> <p>74. Both lysozyme and cytotoxic T cells</p> <p>A). kill cells through chemical interactions B). kill cells by inducing apoptosis C). kill cells by generating a membrane attack complex D). are part of innate immunity</p> <p>75. What are CD4 and CD8?</p> <p>A). proteins secreted by antigen-presenting cells B). receptors present on the surface of natural killer (NK) cells C). T-independent antigens D). molecules present on the surface of T cells where they enhance cellular interaction</p>			

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<p>76. B cells interacting with helper T cells are stimulated to differentiate when</p> <p>A). B cells produce IgE antibodies</p> <p>B). B cells release cytokines</p> <p>C). helper T cells present the class II MHC molecule-antigen complex on their surface</p> <p>D). helper T cells release cytokines</p> <p>77. What is the primary function of humoral immunity?</p> <p>A). It primarily defends against fungi and protozoa</p> <p>B). It is responsible for transplant tissue rejection</p> <p>C). It protects the body against cells that become cancerous</p> <p>D). It produces antibodies that circulate in body fluids</p> <p>78. An immune response to a tissue graft will differ from an immune response to a bacterium because</p> <p>A). MHC molecules of the donor may stimulate rejection of the graft tissue</p> <p>B). the tissue graft, unlike the bacterium, is isolated from the circulation and will not enter into an immune response</p> <p>C). a response to the graft will involve T cells and a response to the bacterium will not</p> <p>D). a bacterium cannot escape the immune system by replicating inside normal body cells</p> <p>79. Where and from what compound(s) is urea produced?</p> <p>A). liver from NH₃ and CO₂</p> <p>B). liver from glycogen</p> <p>C). kidneys from glucose</p> <p>D). kidneys from glycerol and fatty acids</p> <p>80. The transfer of fluid from the glomerulus to Bowman's capsule</p> <p>A). results from active transport</p> <p>B). transfers large molecules as easily as small ones</p> <p>C). is very selective as to which subprotein sized molecules are transferred</p> <p>D). is mainly a consequence of blood pressure in the capillaries of the glomerulus</p>			