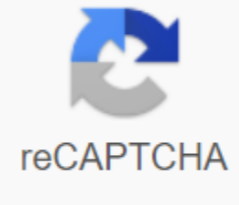




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Biology eoc review packet answer key 2019

Transcript Biology End of Exam Course Packet Goal 1: Student will develop the skills needed to make and understand scientific research. Objective 1 concerns scientific research. These objectives form an integral part of each of the other objectives. 1. What is the scientific method? Give an example of how the scientific method has been used in a biological experiment. Identify and give a brief description of the following terms: * Cases: * Variables: a. dependent b. independent * Control (or comparison) group: a. Why is it important to control variables that you do not test? * Data collected and recorded: a. What is the difference between qualitative and quantitative data? B. Give an example of each. * Charts and graphs: Be able to interpret these! * Data analysis and interpretation: * Communication findings: 2. How does a case become a theory? Repeated tests. Give an example of how new information can change a theory. 3. What are some concerns about the safety of students working in the laboratory? Objective 2: The student will develop an understanding of the physical, chemical and cellular basis of life. 4. What is the function and importance of each of the following organic molecules for organisms? Specify each person's sub units. A. Carbohydrates- energy, carbon + hydrogen + oxygen (certain hydroxyl groups) b. Proteins- structure, enzymes, Group Aminom+ carboxyl + central group of carbon + hydrogen + R (20 variables) c. Lipids- membrane structure, energy CHO d. Nucleic Acids DNA, RNA – genetic information. Nucleotides – sugar, phosphate, base 5. What type of organic molecule is each of the following compounds? A. Starch – energy storage of plant polysaccharide b. Cellulose – polysaccharide – plant cell membrane c. Insulin – hormone from the pancreas that helps transfer glucose to cells d. Glycogen –polysaccharide, long glucose chains stored in the liver of animals e. Glucose – monosaccharide – main source of energy in living beings f. Enzyme – protein, catalyst that reduces activation energy in living beings g. Fat – energy storage, CHO, 3 fatty acids and glycerin. BIOLOGY EOC REVIEW PACKET -1-h. DNA/RNA – genetic information, monomer is nucleotide 6. Which of the following tests could be used to determine whether organic starch compounds, lipids, monosaccharides, or proteins are present? A. Benedict's solution - simple sugars b. Brown paper test - lipids c. Iodine - starch d. Biuret's - Protein 7. Determine the structure and function of each of the organelles listed in the table: Label Structure Function O Core Position of Chromosomes I Cell Membrane Doorman in the cell - decides what goes in and out J Cell wall Structural support in plant cells O Vacuoles Large central kenotopa in plants - structure and water storage NChloroplast Location of photosynthesis F Mitochondria Where energy is collected from during cellular respiration The Ribosomes Protein Synthesis Site 8. Which of the above cells is a plant cell? What's an animal cell? Determine the differences between each cell. The plant cell (II) is on the right. It has a cell wall, chloroplasts and a large central ceatope, which are not found in animal cells. EOC BIOLOGY REVIEW PACKAGE -2-9. Label the following parts of the microscope: eyepiece, course adjustment, fine adjustment, arm, targets, stage, aperture, light source, base 10. Given the magnification of the eyepiece and the magnification of the target, how can you determine the overall magnification? Example: The eyepiece is 10X and the target is 40X. Eyepiece X target magnification = 400X 11. If the field of view is 2000 micrometers across and an object occupies a quarter of the viewing field, how large is it? It's 500 micrometers across. 12. What is the relationship between cells, tissues, organs and organ systems? The hierarchy of life begins with cells that combine to make tissues that combine to make organs and then organ systems. 13. How do the cells of an organism communicate with each other? Chemical signals like hormones. What is the role of receptor proteins? Receptor proteins receive messages outside the cell. What is the role of hormones within an organism? Hormones prov 14. What is homeostasis? Living things maintain a stable internal environment. How is it kept in a cell? – Cell membrane regulates fluids, 15. What is osmosis? Water moving through a membrane from a high concentration area to a low concentration area. What controls osmosis? Concentration gradient – the difference in the condenser between 2 sides of the membrane 16. What is the difference between active transport and passive transfer (diffusion)? Active transport requires energy (ATP) to move substances relative to the concentration gradient. Passive transfer moves with the concentration gradient and does not require additional energy. EOC BIOLOGY REVIEW PACKAGE -3-17. In which direction will the water move in the experimental installation in this diagram? On the left = dissolved soluble . Semi-permeable membrane 18. What is ATP? Which ones are they used for? How does it store energy? How does it release energy? Adenosine triphosphate – Cells use ATP to store energy. Energy is stored in the co-bipolar bonds between phosphates. When the bond broke, the energy is released and ATP becomes ADP. When the energy is added to ADP, a phosphate is added and the molecule becomes ATP 19. What are enzymes? Enzymes are proteins that reduce the activation energy of chemical reactions. 20. Enzymes are 'reusable' and 'specific'. What these two terms? The enzymes enter and leave a chemical reaction unchanged so that they can be used again. The shape of an enzyme determines its function. Each enzyme acts with a specific substrate – locking and basic model. 21. 21. factors affect how an enzyme works; Temperature, pH, substrate concentration, enzyme concentration. 22. Photosynthesis: write the equation - what are the reacting and products? $6H_2O + 6CO_2 + \text{energy} \rightarrow C_6H_{12}O_6 + 6O_2$ Reactive: water, carbon dioxide, solar energy. Works: glucose and oxygen. 23. What is the purpose of photosynthesis? Where is it going? Which living beings perform photosynthesis? Photosynthesis is how plants make sugar (stored food energy) from sunlight. Photosynthesis takes place in the chloroplast of plant cells. It also takes place in some protists and certain bacteria. 24. Cellular breathing: write the equation - what are the reactives and products? $C_6H_{12}O_6 + 6O_2 \rightarrow 6H_2O + 6CO_2 + 38ATP$ Reactants: glucose and oxygen, carbon dioxide products, water and ATP. 25. What is the purpose of cellular respiration? Where is it going? Which living beings perform cellular breathing? Cellular respiration is the hydrolysis of glucose to harvest its energy. It takes place in the mitochondria. All living beings using oxygen (aerobes) perform cellular breathing 26. List of factors that can affect the rate of photosynthesis and breathing. The rate of both processes depends on the availability of the reacts, temperature, pH. EOC BIOLOGY REVIEW PACKAGE -4- 27. What is the difference between aerobic and anaerobic breathing? Anaerobic breathing does not require oxygen, but only crops of 2 ATP. It takes place in the cytoplasm. Aerobics uses oxygen and harvests 38 ATP and takes place in mitochondria 28. What are the 2 types of fermentation? When or why will fermentation take place? The products of alcoholic formation are ethyl alcohol and carbon dioxide. Organisms like yeasts make this kind of fermentation. Lactic acid fermentation is what happens to human muscles - producing lactic acid. Objective 3: The student will develop an understanding of the continuity of life and changes of organisms over time. 29. What is DNA? Rna? How is it similar? How is it different? DNA and RNA are nucleic acids that store genetic information. DNA is what chromosomes are made of and resides in the nucleus. It consists of 4 bases of adenine, thymine, tropin and cytosine. RNA is a molecule involved in protein synthesis. It consists of 4 bases: adenine, uricil, tropin and cytosine. DNA is a double stranded propeller containing deoxyribose sugar. RNA is single stranded and contains ribose sugar. 30. Design and highlight the structure of the double propeller. 31. What does the nucleotide sequence mean in the DNA code? - proteins 32. What kind of bonds keep nitrogen bases together? Hydrogen bonds 33. How do nitrogen bases mate? A with T, C with G What is DNA replication? When and where is it done? DNA reproduction is the treatment of DNA during phase S of the phase between phases. DNA is copied to the nucleus of a cell that will soon be So each new cell has an exact copy of DNA 35. Explain how reproduction makes a new DNA molecule consisting of a strand of old DNA and a strand of new DNA. DNA unzips and each side of DNA acts as a model for the newly formed complementary strand. The two new DNA molecules each have an old backbone and a new one. 36. What are mutations? Changes in the sequence of nucleotides n DNA. 37. What is transcription? Where is it going? Transcription is the copying of DNA code from mRNA. The transcription takes place in the kernel. The neoformal mRNA travels from the nucleus to the ribobody. 38. Name the 3 types of RNA and describe the function of each. a. mRNA brings DNA code to ribosomes b. tRNA brings the appropriate amino acid to ribosome c. rRNA is the ribosome itself. 39. What is translation? Where is the translation done? In translation the ribobody matches the base pairs in mRNA with those in tRNA. It's taking place on the ribobody. The ribobody collects the amino acids brought to it by tRNA in the right order. 40. What is codon? What information does codon provide? You can use a codon diagram. A codon is any 3 bases in MRNA. Each codon codes for a specific amino acid. 41. If given the DNA sequence is ATG TCA TTC TGA, what is the mRNA sequence? UAC AGU AAG ACU What is the amino acid sequence? You're going to need a codon chart for this. EOC BIOLOGY REVIEW PACKAGE -5-42. How is it possible that most cells in an organism have the same DNA but perform different functions within the body? DNA is the same in each cell, but only part of the DNA is expressed, depending on the function of the cell. 43. Compare and contrast mitosis & meiosis; reduction: Meiosis Mitosis What is the purpose? Make new cells to make gametes grow, heal and replace old cells How many parts? One or two How many cells are produced? 2 4 How does the number of chromosomes not change half? In which cells appears somatic cells gametes Asexual / Sexual reproduction No Sexual repro 44. Put the following charts of mitosis in order: DACBD 45. Where are the chromosomes in a cell? Where did the genes come from? To the core. Genes are parts of chromosomes (or DNA). 46. How are chromosome bonds similar? How is it different? Bonds have the same kinds of characteristics, but the actual expression of these characteristics may be different, e.g. blue eyes, brown eyes. 47. Define the following sources of variation and tell where it can occur in the cell cycle: crossbreeding, random variety of chromosomes, gene mutation, non-accession, fertilization. A. Crossing – genes jump from homologous chromosome to homologous chromosome during prephase of meiosis b. Random variety - chromosomes mom and dad can both end up in a gametes in any combination c. Gene mutations – a change one or more bases BIOCY EOC REVIEW REVIEW -6-d. Non-disconnection is an error in meiosis in which a gamet gets extra or fewer chromosomes. Q. Fertilization causes the chromosomes of mom and dad to blend. 48. Who is Gregor Mendel? What'd he do? Father of genetics. He developed the three laws of genetics 49. Please indicate the following: a. Rule of sovereignty: a gene is always dominant (exception – co-sovereignty and incomplete sovereignty) b. Separation law: Genes separately in gametes (exception – non-separation) c. Law of independent variety: genes separate independently from each other. (exception – gene connection). 50. What is the difference between genotype and phenotype? Genotype – alleles or letters. Phenotype – the appearance. 51. What determines an organism's phenotype? They're genes. gene dominance, gene expression: peer or incomplete dominance, polygenic characteristics, multiple alleles. Is it based only on the genotype? Based on genotype, multiple alleles and epigenetic expression. Diet, environment and DNA packaging also have an effect on gene expression. 52. The gene for tall pea plants (T) is dominant. The gene for short pea plants (t) is recessive. A heterozygous tall pea plant intersects with a short pea plant. What are the genotypes of maternal plants? Tt and tt 53. What are the genotypes and phenotypes of the descendants of this cross (#51)? Use a Punnett square to see your work. Half of the offspring will be Tt and half will be tt 54. Be able to solve and interpret problems featuring single-celled crosses. (Parent, F1, F2 generations) 55. What's a karyotype? How can sex or chromosomal abnormalities be determined by a karyotype? A karyotype is a photo of someone's chromosomes. They can be tested for abnormal position genes and abnormal chromosome numbers. 56. Discuss these heritage patterns and give an example of each. Be able to solve and interpret crosses using Punnett squares. a. Simple comfortable heredity – allele can be covered by a dominant allele. b. simple dominant heredity – the dominant alleles are expressed c. incomplete sovereignty – no allele is dominant – are mixed. D. Codominance – both alleles are dominant and expressed e. multiple alleles – more than two types of alleles for a characteristic – e.g. blood group A, B, and o. f. sex-related inheritance – alleles in the same chromosomes travel together and express themselves together. g. Polygenic characteristics - more than one gene determines a characteristic - examples of hair color, skin color, height. 57. How can you a test cross to determine the genotype of an organism? If you cross an unknown genotype with the comfortable genotype, the offspring's genotypes will reveal the missing genetic information. 58. Briefly describe the genetic cause of these BIOLOGY EOC REVIEW PACKET conditions -7- a. Sickle cell anemia – mutation site – substitution of a letter in DNA codes The wrong amino acid. Blood cells have a sickle shape. b. Color blindness - X connected characteristic, recessive c. Cystic fibrosis - recessive, physical characteristic. d. Hemophilia – X connected characteristic, recessive e. Down syndrome – non-disconnection, 3 copies of chromosome 21. F. Huntington's disease physically, dominant characteristic. 59. Design a lineage of your imaginary family that shows the characteristic of having a white forelock of hair just above the front. Grandpa had the white feature of forelock. Grandma didn't do it. Two of his children, your uncle Bob and your mother, inherited the trait. His other child, your aunt Joan, didn't inherit the trait. Three grandchildren have the trait, and two don't. Your dad doesn't have a white hair forelock, but your older sister and brother do. You don't have one yet. Of Uncle Bob's children, Your cousin has a white forelock and cousin Sally doesn't. After you design the pedigree, make an assumption about whether the feature is dominant or recessive. What are your chances of having a white hair forelock when you get older? 60. What were the reasons for drawing up the human genome plan? To understand the order of the bases in the human genome. To figure out what code to and finally understand how to fix problems. How can the project help determine whether a person carries genes for a genetic condition? Comparing the DNA of a normal healthy person with the DNA of a sick person. How can it help develop gene therapy? Once we understand the genetic error, we can explore ways to fix it. 61. Explain how gel electrophoresis separates molecules based on size. The molecules move through the gel according to their charge, mass and size. 62. What is DNA fingerprinting? What are some useful applications of DNA fingerprinting? Dna fingerprinting involves cutting different DNA samples with containment enzymes and operating them through a gel. Differences in the mass, cost and size of DNA fragments will determine differences between individuals. This can be used to identify criminals, victims and diseases. 63. Give a brief explanation for endosymbiont theory - Prokaryotic cells devour other cells that happened to be able to do photosynthesis or cellular breathing. They took residence within these cells and formed a mutual symbiotic relationship in which both organisms benefited. 64. How did the earth's early atmosphere affect the type of organisms developed (anaerobic and prokaryotic)? There was no in the Earth's early atmosphere, so organisms had to harvest energy from anaerobic glucose – through fermentation. This results in very little ATP so these organisms were small and slow. 65. Define the theory of evolution by natural selection. Discuss Darwin's contribution to this theory. Use these terms or concepts in your paragraph: variation, hereditary characteristics, characteristics, environment, survive, reproduce, competition or struggle, common, descent or descended. Organisms that fit their environment can find resources (food, water, shelter, companions, etc.) and reproduce.... etc. Explain how the evidence for evolution helps explain the theory. a. Fossil record (evidence of extinct animals, as well as evidence of evolving structures and climate change.) * What is the difference between relative (comparing rock layers - newer at the top) and absolute dating methods? (Radiometric dating - actually measuring age.) EOC BIOLOGY REVIEW PACKAGE -8-b. Common anatomical structures (indicates common ancestor). c. Biochemical similarities (DNA and protein similarities) 67. How do variations provide material for natural selection? What role does the environment play in selecting customizations? Variations provide flexibility in the event of a change in environmental conditions. Some will survive, some will die. 68. Specialization is the development of new species through evolution. What is the role of geographical isolation in specialisation? If a species is separated by a geographic barrier for some time, random mutation changes will accumulate enough to separate the two regions into two separate species; 69. Give an example of the natural selection currently observed in the world using antibiotic and pesticide resistance. 70. Fill in the diagram below. Cell type Same prokaryotic Both have ribosomes, DNA, maintain homeostasis and have metabolism Eukaryotics Different Prokaryotics do not have membrane or nucleus organelles. Only single cell. Eukaryotic cells have a nucleus and organelles attached to the membrane. Single cell and multicellular 71. What is the interactive role of genetics and the environment in sickle cell anemia and malaria? Heterozygote advantage – heterozygous have mild sickle cell anemia and resistance to malaria. Objective 5: The student will develop an understanding of the ecological relations between the organisms. 72. 73. 74. 75. 76. What is the relationship between organisms, populations, communities and ecosystems? Ecosystems consist of all abiotic and living factors in one region. A community consists of only one species. An organism is an individual. Explain how abiotic and biotic factors relate to each other and their importance in ecosystems. Living organisms depend on abiotics for the supply of water, shelter, etc. Living species must be compatible with their environment. What is cohabitation? Describe the following symbiotic relationships: mutual commensalisms, and parasitism. Symbiosis – a permanent relationship between 2 organizations that benefits at least one of them. Mutuality benefits both. Commensalism benefits one and does not harm the other. Parasitism benefits one and harms the other. What is a predator/prey relationship? The size of the predator population affects the population prey and vice versa. If the predators are too many, the prey falls down. If the prey is numerous, the predators go up. What is carrying ability? How can restrictive factors (food availability, competition, harsh winters) affect carrying capacity? Carrying capacity is the maximum number of people who can consistently support an environment. Transport capacity is determined by food, competition, etc. EOC BIOLOGY REVIEW PACKAGE -9- 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. Be able to interpret population growth charts. What is exponential growth (J-curve)? What is logistics development (S-curve)? Describe the relationship of the carbon cycle to photosynthesis and breathing. Photosynthetic organisms receive carbon dioxide for photosynthesis and release oxygen. Aerobic organisms receive oxygen and release carbon dioxide. Design a food chain and highlight the organisms: producer, consumer, herbivore, carnivore, omnivore, decomposer. Explain the flow of energy in an ecosystem. Include terms such as food level, food tissue and energy pyramid. Remember, only 10% of the energy in one organism passes to the next food level. What do the human population growth charts tell us about historical and possible changes? Since the advent of agriculture and later the industrial revolution, the size of the human population has exploded exponentially. At some point we will reach carrying capacity and, according to Malthus, this will lead to famine, war or other disasters. Explain how each of the following factors affects human populations: birth rate, mortality rate, population size, density and use of resources in the environment. Explain how each of the following human activities affects local ecosystems: acid rain, habitat destruction and the introduction of non-native species. How do they affect global warming and natural environmental processes (e.g. volcanoes)? Correlation of the carbon cycle and human effects on atmospheric carbon dioxide. People don't always have a direct impact on natural resources. What are some indirect effects of deforestation, pesticide use and bioaccumulation? What is a sustainable practice? Give an example. EOC BIOLOGY REVIEW PACKAGE -10 - -

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