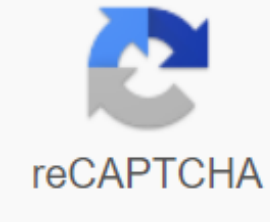




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Biology eoc review packet answers

Transcript Biology End of Course Examination Packet Purpose 1: Learner will develop capabilities needed to conduct and understand scientific examination. Aim 1 addresses scientific investigation. These goals are an integral part of each of the other objectives. 1. What is the scientific method? Give an example of how the scientific method was used in a biological experiment. Identify and give a brief description of the following terms: * Hypotheses: * Variables: a. dependent b. independent * Control (or equation) group: a. Why is it important to control the variables that you don't test? * Data collected and recorded: a. What is the difference between qualitative and quantitative data? B. Give an example of each. * Maps and graphs: Can interpret it! * Analyze & interpret data: * Communicate findings: 2. How does a hypothesis become a theory? Repeated testing. Gives an example of how new information can change a theory. 3. What are some safety concerns for students working in the laboratory? Aim 2: Learner 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 to organisms? Identify the subunits of each. A. Carbohydrate energy, carbon + hydrogen + oxygen (some hydrogen groups) b. Protein structure, enzymes. Amino group + carboxyl group + central carbon + hydrogen + R group (20 variables) c. Lipids- membrane structure, energy CHE d. Nucleic acids DNA, RNA - genetic information. Nucleotides – sugar, phosphate, base 5. What type of organic molecules are each of the following compounds? A. Starch – polysaccharide energy storage of plants b. Cellulose – polysaccharide – celluery of plants c. Insulin – hormone from pancreas that helps in glucose transportation in cells d. Glycogen – polysaccharide, long chains of glucose stored in the liver of animals. Glucose – monosaccharide – main source of energy in living things f. Enzyme – protein, catalyst that lowers activation energy in living things g. Fats – energy storage, CHE, 3 fatty acids and a luke roll. BIOLOGY EOC REVIEW PACKET -1- h. DNA/RNA - genetic information, monomer is a nucleotathyd 6. Which of the following tests can be used to determine whether the organic compounds are starchets, lipids, monosaccharides, or proteins present? A. Benedict's solution – simple sugars b. Brown paper test - lipids c. Afdium - starch d. Biuret's - protein 7. Identify the structure and function of each of the organelles listed in the table: Label Structure Function O Nucleus Location of chromosome I Cell (plasma) membrane Doorman to the cell - decide what's going in and out J Cell wall Structural support in plant cells O Vacuoles Large central vacuum in plants - structure and water storage N Site of photosynthesis F Mitochondria Where energy is harvested from during cellular breathing H Ribosomes Site of protein synthesis 8. Which of the above cells is a plant cell? What is an animal cell? Identify the differences between each cell. The plant cell (I) is on the right. It has a cell wall, chloroplasts and large central vacuum, all of which are not found in animals cells. BIOLOGY EOC REVIEW PACKET -2-9. Label the following parts of the microscope: eyepiece, course adaptation, fine adjustment, poor, goals, stage, aperture, light source, base 10. Given the enlargement of the eyepiece and the enlargement of the goal, how can you determine the total enlargement? Example: Eyepiece is 10X and Goal is 40X. Eyepiece X enlargement of goal = 400X 11. If the field of view is 2000 micrometers left and an object records one-quarter of the viewing field, how big is it? It is 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 make organ systems. 13. How do cells communicate within an organism with each other? Chemical signals such as hormones. What is the role of receptor proteins? Receptor proteins receive messages from outside the cell. What is the role of hormones within an organism? Hormones proved 14. What is homeostasis? Living things maintain a stable internal environment. How is it maintained in a cell? – Cell membrane regulates liquids, 15. What is osmosis? Water moves through a membrane from an area of high concentration to an area of low concentration. What does osmosis control? Concentration graduate - the difference in concentrate between 2 sides of the membrane 16. What is the difference between active transport and passive transportation (diffusion)? Active transport requires energy (atp) to move substances against the concentration gradient. Passive transport moves with the concentration gradient and requires no additional energy. BIOLOGY EOC REVIEW PACKET -3-17. In which direction will water move in the experimental setup in this diagram? On the left – dissolved dissolved. Semi-transmeasible membrane 18. What is ATP? What is it used for? How does it store energy? How does it release energy? Adenosient triphosphate – Cells use ATP to store energy. Energy is stored in the covalent ties between the phosphate. When the tape it broke, energy is released and ATP becomes ADP. When adding energy to ADP, a phosphate is added and the moleculus becomes ATP 19. What are enzymes? Enzymes are proteins that lower the activation ninot of chemical reactions. 20. Enzymes are re-quacluable and specific. What do those two terms mean? Enzymes enter and leave a chemical reaction unchanged so that they can be used again. The form of an enzyme determines its function. Each enzyme acts with a specific substrate - lock and key model. 21. factors affect how an enzyme works? Temperature, pH, concentration of substrate, concentration of enzyme. 22. Photosynthesis: write the equation – what is the reactants and the products? $6H_2O + 6CO_2 + \text{energy} \rightarrow C_6H_{12}O_6 + 6O_2$ Reactants: water, carbon dioxide, sunlight energy. Projects: glucose and oxygen. 23. What is the purpose of photosynthesis? Where does it occur? What living things perform photosynthesis? Photo synthesis is how plants make sugar (stored food energy) of sunlight. Photo synthesis takes place in the chloroplast of plant cells. It also takes place in some protistes and some bacteria. 24. Cellular breathing: write the equation – what is the reactants and the products? $C_6H_{12}O_6 + 6O_2 \rightarrow 6H_2O + 6CO_2 + 38ATP$ Reactants: glucose and oxygen, products carbon dioxide, water and ATP. 25. What is the purpose of cellular breathing? Where does it occur? What living things perform cellular breathing? Cellular breathing is the hydrolysis of glucose to harvest its energy. This takes place in the mitochondria. All living things that use oxygen (aerobes) perform cellular breathing 26. List of factors that can influence the rate of photosynthesis and breathing. The rate of both processes depends on the availability of the reactants, temperature, pH. BIOLOGY EOC REVIEW PACKET -4-27. What is the difference between aerobic and anaerobic breathing? Anaerobic breathing does not require oxygen, but only crops 2 ATP. This takes place in the sitoplasma. Aerobic uses oxygen and crops 38 ATP and takes place in the mitochondria 28. What is the 2 types of fermentation? When or why would fermentation take place? The products of alcoholic formation are ethyl alcohol and carbon dioxide. Organisms like yeasts do this kind of fermentation. Lax acid fermentation is what happens in human muscles – producing acid. Aim 3: Learner will develop an understanding of the continuity of life and the changes of organisms over time. 29. What is DNA? Rna? How are they similar? How are they different? DNA and RNA are nucleic acids that store genetic information. DNA is of which chromosomes are made and it lives in the core. It consists of 4 bases of adenine, yourmine, taranine and cetoin. RNA is a molecule involved in protein synthesis. It consists of 4 bases: adenine, uracil, guanine and cetoptin. DNA is a double stranded helix that contains the sugar deoxyribosis. RNA is single stranded and contains the sugar ribosis. 30. Draw and label the dual helix structure. 31. What do the order of nucleotides in DNA code for? - Protein 32. What kind of tapes do the nitrogen bases hold together? Hydrogen bonds 33. How do the nitrogen bases are? A with T, C with G 34. What is DNA replication? When & where does this happen? DNA replication is dealing with DNA during S phase of interphase. DNA is copied at the core of a cell that so each new cell has an exact copy of the DNA 35. Explain how replication makes a new DNA moleculaction consisting of one string of old DNA and one string of new DNA. DNA unzips and each side of the DNA serve as a template for the newly formed supplementary strand. The 2 new DNA molecules each have an old spine and a new one. 36. What are mutations? Changes in the sequence of nucleotides a DNA. 37. What is transcript? Where does it occur? Transcript is copying the DNA code by mRNA. Transcript takes place at the core. The newly established MRNA travels from the core to the ribosome. 38. Name the 3 types of RNA and describe the function of each. a. mRNA carries the DNA code to the ribosome b. tRNA brings the appropriate amino acid to the ribosome cRNA is the ribosome itself. 39. What is translation? Where is translation taking place? In translation the ribosome matches base pairs into mRNA with those in tRNA. This takes place at the ribosome. The ribosome assemble the amino acids brought in the correct order by the tRNA. 40. What is a kodon? What information does the codon provide? Be able to use a codon chart. A codon is any 3 bases in mRNA. Each codon codes for a specific amino acid. 41. If the DNA sequence is ATG TCA TTC TGA, what is the mRNA sequence? UAC AGU AAG ACU What is the amino acid sequence? You will need a codon chart for this. BIOLOGY EOC REVIEW PACKET -5-42. How is it possible that most of an organism's cells have the same DNA, but perform different functions within the organism? DNA is the same in each cell, but only some of the DNA is expressed depending on the function of the cell. 43. Compare and contrastmitosis & meiosis: Mitosis Meiosis What is the purpose? Does new cells for Make games grow, healing and replacing old cells How many sections? One two How many cells are produced? 2 4 How does the chromosome number No half change? In which cells it happens Somatic cells spell asexual/sexual reproduction No Sexual Repro 44. Place the following diagrams of mythosis in order: DACBD 45. Where are chromosomes found in a cell? Where were genes found? At the core. Genes are parts of chromosomes (or DNA). 46. How are homologians chromosomes alike? How are they different? Homologologists chromosomes have the same kind of characteristics, but the actual expression of those characteristics may be different, e.g. blue eyes, brown eyes. 47. Define the following sources of variation and tell where each one can occur in the cell cycle: crossing over, random range of chromosomes, no mutation, non-disjunction, fertilization. A. Crossing over - genes jump from homologous chromosome to homologous chromosome during prophase 1 of meiosis b. Random grouping – Mom and Dad's chromosomes can both end up in a game in any combination c. No mutations – a change one or more bases BIOLOGY EOC -6- d. Non-disjunction is an error in meiosis in which a game gets extra or less chromosomes. E. Fertilizer causes the mixing of mom and dad's chromosomes. 48. Who is Gregor Mendel? What did he do? Father of genetics. Develop the 3 laws of genetics 49. Name the following: a. Rule of Domination: one gene is always dominant (exception - cognitive and incomplete dominance) b. Law of Segregation: Genes separate into games (exception – non-disjunction) c. Law of Independent Group: genes separate from each other. (exception – no liaison). 50. What is the difference between a genotype and a phenotype? Genotype – the needles or letters. Phenotype – the appearance. 51. What does the phenotype of an organism determine? It's gene. No dominance, no expression: cognitive or incomplete dominance, polygenic properties, multiple allele. Is it based on the genotype alone? Based on genotype, multiple allele and epigenetic expression. Nutrition, environment and DNA packaging also have an effect on no expression. 52. The gene for high pea plants (T) is dominant. The gene for short pea plants (t) is recessive. A heterozygous long pea plant is crossed with a short pea plant. What are the genotypes of older plants? Tt and tt 53. What are the genotypes and phenotypes of the offspring of this cross (#51)? Use a Punnett Square to show your work. Half of the offspring will be Tt and half will be tt 54. Be able to solve and interpret problems with monohybrid crosses. (Older, F1, F2 generations) 55. What is a carotype? How can gender or chromosomal abnormalities be determined by a carpetipe? A carotypic is a picture of someone's chromosomes. They can be examined for abnormally place genes and abnormal numbers of chromosomes. 56. Discuss these patterns of heritage and give an example of each. Be able to solve and interpret crosses using Punnett squares. a. simple recessive heredity – alleel can be masked by a dominant allele. b. simple dominant heredity – dominant allele is expressed c. D. Codoson - both alleles are dominant and are expressed e. several allele - more than two kinds of allele for a trait - e.g. blood type A, B, and o. f. sex-linked heritage - allele on the same chromosomes traveling together and are expressed together. g. polygenic properties – more than one n determines a trait - examples hair color, skin color, height. 57. How can you use a test cross to determine the genotype of an organism? If you are transgressing an unknown genotype with the recessive genotype, the genotypes of offspring will reveal the missing genetic information. 58. Briefly describe the genetic cause of these conditions BIOLOGY EOC REVIEW PACKET -7- a. Single cell anemia – point mutation – replacement of one letter in DNA codes the wrong amino acid. Blood cells were formed sole. b. Colorblindness - X linked property, recessive c. Cystic fibrosis – recessive, somatic trait. d. Hemophilia – X connected property, recessive e. Down syndrome - non-disjunction, 3 copies of chromosome 21. F. Huntington's Disease Somatic, Dominant Trait. 59. Draw a pedigree of thy fictional family, showing the trait of a white foreshaking just above the forehead. Grandpa had the white front-ching feature. Granny didn't. Two of his children, your uncle Bob and your mother, inherited the trait. His other child, your aunt Joan, did not inherit the trait. Three grandchildren have the trait, and two do not. Your father doesn't have a white shake of hair, but your older sister and brother do. You don't. Out of Uncle Bob's children, Cousin Sue did a white apron and Cousin Sally. After you've drawn the pedigree, make a hypothesis about whether the feature is dominant or recessive. What are your chances of getting a white taste of hair when you get older? 60. What were the reasons for the establishment of the human genome project? To understand the order of bases in the human genome. To understand what they are coded for and finally, to understand how to solve problems. How can the project help determine if an individual carries genes for a genetic condition? Compare normal healthy individual's DNA with a sick person's DNA. How can it help develop no therapy? Once we understand the genetic error, we can explore ways to fix it. 61. Explain how gel electrophysis separates molecules based on size. Molecules move through the gel according to their charge, mass and size. 62. What are DNA fingerprints? What are some useful applications from DNA fingerprints? DNA fingerprints involve cutting different DNA samples with limiting enzymes and running them through a gel. Differences in mass, load and size of the DNA fragments will identify differences between individuals. It can be used to identify criminals, victims and diseases. 63. Give a brief explanation for Endosymbiont theory – Prokaryotic cells engulf other cells that happened to be able to do photo synthesis or cellular breathing. They took residence within these cells and formed a mutually symbiotic relationship in which both organisms benefited. 64. How did the early Earth's atmosphere develop the type of organisms that have evolved (anaerobic and proctaryotic)? There was no oxygen in the earth's early atmosphere so organisms had to harvest energy from glucose anaerobics – through fermentation. This leads to very little ATP so these organisms were small and slow. 65. Define the theory of evolution through natural selection. Discuss Darwin's contribution to this theory. Use these terms or concepts in your paragraph: variation, inherited properties, environment, survive, reproduce, competition or struggle, common, descent or descending. The organisms that fit their environment can find resources (food, water, shelter, mates, etc.) and get to produce.... etc. 66. Explain how the evidence for evolution helps explain the theory: a. Fossil record (evidence of expansive animals as well as evidence of developing structures and climate change.) *What is the difference between relative (comparison of rock layers - latest above) and absolute dating methods? (Radiometric dating – actually measuring age.) BIOLOGY EOC REVIEW PACKET -8-b. Shared anatomical structures (indicator general ancestor.) c. Biochemical similarities (DNA and protein similiarites) 67. How do variations of material for natural selection? What role is the environment to choose adjustments? Variations provide flexibility if environmental conditions change. Some will be able to survive, some will die. 68. Specification is the development of new species through evolution. What is the role of geographical insulation in specification? If a species is separated by a geographic barrier for long enough, random mutation changes will

accumulate enough to separate the two areas into two separate species. 69. Give an example of natural selection taking place in the world today using antibiotic resistance and pesticides. 70. Fill in the graph below. Cell type The Same Proctaryotic Both have ribosome, DNA, maintain homeostasis and have metabolism Eukaryotic Different Prokaryotes have no membrane organelle or core. Unicellular only. Eukaryotic cells have a membrane-bound core and organelle. Uniseelular and multicellular 71. What is the interactive role of genetics and the environment in Sekelsel Anemia and Malaria? Heterozygote benefit - heterozygotes have mild cell anemia and resistance to malaria. Aim 5: Learner will develop an understanding of the ecological relationships between organisms. 72. 73. 74. 75. 76. What is the relationship between organisms, populations, communities and ecosystems? Ecosystems consist of all abiotic and biotic factors in an area. A community consists of all biotic factors. A population consists of only one species. An organism is an individual. Explain how abiotic and biotic factors are associated with each other and their importance in ecosystems. Biotic organisms depend on abiotic people to water, shelter, etc. Biotic species should be compatible with their environment. What is symbiosexy? Describe the following symbiotic relationships: mutualism, commensalisms and parasitism. Symbioses – a permanent relationship between 2 organisms that benefit at least one of them. Mutualism both benefit. Commensalism does benefit one and does not harm the other. Parasitism benefits one and harms the other. What is a predators/prey ratio? The of predators affects the population population prey and vice versa. If predators are numerous, prey goes down. As prey, many predators go on. What does capacity bear? How can the limitation of factors (food availability, competition, hard winters) affect carrying capacity? Carrying capacity is the maximum number of individuals who can support an environmental stability. Carrying capacity is determined by food, competition etc. BIOLOGY EOC REVIEW PACKET -9-77. 78. 79. 80. 81. 82. 83. 84. 85. 86. Be able to interpret population growth graphs. What is exponential growth (J-curve)? What is logistical growth (S-curve)? Describe the ratio of the carbon cycle to photosynthesis and breathing. Photo synthetic organisms take in carbon dioxide for photo synthesis and release of oxygen. Aerobic organisms take in oxygen and release carbon dioxide. Draw a food chain and label the organisms: producer, consumer, herbivores, carnivores, omnivores, dissolved. Explain the flow of energy in an ecosystem. Includes terms such as tropical level, food web, and energy pyramid. Remember, only 10% of the energy in an organism is transferred to the next trophy level. What do human population growth graphs tell us about historical and potential changes? Since the coming of agriculture and later the industrial revolution, human population size has exploded exponentially. We will at some point reach carrying capacity and according to Malthus it will result in famine, war or other disasters. Explain how each of the following factors brings about human populations: birth rate, mortality rate, population size, density and resource use on the environment. Explain how each of the following human activities impacts local ecosystems: acid rain, habitat cultivation, and the introduction of non-indigenous species. How does greenhouse effect and natural environmental processes (e.g. volcanoes) affect climate? Keep the carbon cycle and human impact on atmospheric carbon dioxide. People don't always have a direct impact on natural resources. What is some indirect impact of deforestation, pesticide use and bioaccommodation? What is a sustainable practice? Give an example. BIOLOGY EOC REVIEW PACKET - 10 - -

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