

Genetics: practice test questions essay



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Practice Questions for FALL FINAL Biology

KEY Note: These are a few sample questions that you can work through for more practice with genetics and experimental design. You should also review the evolution and experimental design quizzes and exams. These questions do NOT cover all of the material covered this semester. Completion of these questions alone will not be sufficient preparation for the final exam.

Use the diagram below for #1: The arrangement of chromosomes in the diagram below is known as a karyotype. If the chromosomes of a female were arranged like the chromosomes of this male, which of the following would be true when the two karyotypes were compared? They would be identical (contain the same number and types of chromosomes) The karyotype of the male would contain one additional chromosome The karyotype of the female would contain one-half the number of chromosomes Karyotypes would appear different for one chromosome pair Certain insects resemble the bark of the trees on which they live. Which statement provides a possible biological explanation for this resemblance? The insects needed camouflage so they developed protective coloration. Natural selection played a role in the development of this protective coloration. The lack of mutations resulted in the protective coloration.

The trees caused mutations in the insects that resulted in protective coloration. An experiment was carried out to determine whether drinking

caffeinated soda increases pulse rate. The pulse rates of two groups of people at rest were measured. Group A was then given caffeinated soda and group B was given caffeine-free soda.

One hour after drinking the soda, the pulse rates were measured. The participants in the experiment were all the same age, and they were all given the same amount of soda. The dependent variable in this experiment is the Type of soda given to each group Amount of soda given to each group Pulse rate of each group Age of participants in each group A student conducted an experiment to determine if listening to different types of music would affect pulse rate. She thought that pulse rate would change with different types of music. Each person participating in her experiment listened to seven different selection of music for 30 seconds each. The pulse rates were taken after each 30-second interval of music.

Based on her experiment, the student concluded that a person's pulse rate changed when listening to different types of music. The component missing from this experiment is a Prediction Hypothesis Control group (SOC)

Research plan The pedigree of Seattle Slew, a racehorse considered by some to be one of the fastest horses that ever lived, includes very fast horses on both his mother's side and his father's side. Seattle Slew most likely was a result of Environmental selection Artificial alteration of DNA molecules Selective breeding. A sudden mutation Which statement is best supported by the theory of evolution? Genetic alterations occur every time cell reproduction occurs. The fossil record provides samples of every organism that ever lived. Populations that have advantageous characteristics will increase in number.

Few organisms survive when the environment remains the same A species that lacks the variation necessary to adapt to a changing environment is more likely to Develop many mutated cells Become extinct over time Begin to acquire mutations that allow it best respond to changes in environment Develop resistance to diseases . Three days after an organism eats some meat, many of the organic molecules originally contained in the meat would be found in newly formed molecules of ProteinB. Amino AcidsC. DNAD. Fats If 15% of a DNA sample is made up of thymine, T, what percentage of the sample is made up of cytosine, C? 15% B.

70%C. 35% b/c 30% = A&T than 70% = C&GD. 85% Which statement concerning the evolution of species A, B, C, D, and E is supported by the diagram below? Species B and C can be found in today's environments. Species A and D evolved from E.

Species A and C can still interbreed. Species A, B, and E all evolved from a common ancestor and all are successful today. The chart below compares the size of three structures: a gene, a nucleus, and a chromosome. Based on this information, structure A would most likely be a Chromosome that is part of structure C Chromosome that contains structures B and C Nucleus that contains both structure B and structure A Gene that is part of structure B Sudden Death from a Marine Predator Members of the Conidae family (cone snails) have been collected for centuries for their beautiful and elaborately detailed shells. Cone snails are marine mollusks found in reef environments throughout the world.

Cone snails feed on organisms such as fish, worms, and other mollusks. They are very slow moving but capture their prey by paralyzing them using venom. The venom contains some of the most deadly neurotoxins known. The neurotoxins work by attaching to receptor molecules on nerves, blocking the transmission of nerve impulses.

The neurotoxins are injected into the prey by way of a hollow, spearlike tooth and the effects are usually immediate. One species, a fish-eating cone snail, can paralyze the prey in about two seconds. The venom produced by each species is prey specific. It may contain two or more different types of neurotoxins, each composed of long chains of amino acids. What type of molecule is the neurotoxin? DNA RNA Amino Acid Protein. The photograph below shows a pill bug.

Pill bugs are small animals frequently found in wooded areas near decomposing organic material. Describe some parts of an experiment to determine the preference of pill bugs for light or darkness. In your answer be sure to:

- state a hypothesis
- identify the independent and dependent variables in the experiment;
- identify two conditions that should be kept constant

state one example of experimental data that would support your hypothesis.

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Provide a Darwinian explanation for the evolution of the tough exoskeleton of the pill bug. Suppose its ancestors were soft-bodied. Complete answers should identify the heritable trait variation in ancestral population and the source as some type of random mutation. Identify the selective pressure

Identify survival of the fit Describe how frequency of the traits changed over time Explain the idea: Survival of the FIT ENOUGH.

What does the concept mean? What misconceptions does it address? See homework Evolution 101: survival of the fit enough Use the diagram below to complete the questions below. Use the universal genetic code (above) and your knowledge of DNA and RNA to complete the chart below 17. According to the information in the chart that you completed, which two species are most closely related? Support your claim. Species B and Species E—only 3 nucleotide differences and they have the same amino acid sequence 18.

Describe/Sketch the processes which create proteins from the information in the DNA. Where does each process occur in the cell? Review notes and module on transcription and translation 19. Scientists are increasingly concerned about the possible effects of damage to the ozone layer. Damage to the ozone layer has resulted in mutations in skin cells that lead to cancer. Will the mutations that caused the skin cancers be passed on to offspring? Explain your answer. NO—somatic cell mutations are not heritable 20.

Describe a few of the functions of proteins in your body. Defender proteins, structural proteins, transport proteins...