Blizzard Bag #3 - Biology Assignment

Please read and answer the following OGT practice test on the answer document that follows. This assignment will be due two weeks from the date assigned. The only sheet that needs printed out is the answer document to be turned in.

Use the table to answer question 33.

Speed of Sound

Substance	Temperature (°C)	Speed (m/s)
dry air	0	331
	25	346
	100	366

33. Could the speed of sound be used to estimate dry air temperature, based on the data above?

A. No, because the speed of sound in dry air is the same regardless of temperature.

B. No, because as temperature increases, the speed of sound in dry air increases.

C. Yes, because as temperature increases, the speed of sound in dry air increases.

D. Yes, because as temperature decreases, the speed of sound in dry air increases.

34. In Aristotle's treatise *On Meteorology*, he stated that:

"The same parts of the Earth are not always moist or dry, but they change accordingly as rivers come into existence and dry up. And so the relation of land to sea changes too and a place does not always remain land or sea throughout all time, but where there was dry land there comes to be sea, and where there is now sea, there one day comes to be dry land. ..."

Aristotle was referring to the

A. depletion of natural resources.

B. cyclic nature of Earth processes.

C. relationship between latitude and climate.

D. effects of humans on biogeochemical cycles.

Use the information below to answer questions 35 – 38.

A group of students designs an experiment to test how an herbicide affects pepper plants and weeds. Eight plots are tested, each of which holds 25 pepper plants and a variety of weeds. Plots 1 and 2 are not treated; plots 3 – 8 are treated with varying amounts of weed-killing herbicide. The weeds are counted in each plot during week 1. The herbicide is applied during week 2, and the weeds are counted again in week 3. The data are shown in the table below.

Effects of Herbicide on Plant Growth

Plot	Herbicide Dose	Number of Pepper Plants That Die Before Producing Fruit	Week 1 Number of Weeds	Week 3 Number of Weeds
1	No herbicide application	3	30	33
2	No herbicide application	5	35	40
3	50% of recommended dose	3	42	24
4	50% of recommended dose	3	43	14
5	100% of recommended dose	4	47	7
6	100% of recommended dose	6	42	3
7	150% of recommended dose	12	43	2
8	150% of recommended dose	15	45	5

35. Prior to herbicide application, a student notes that there are two related species of weeds (A and B) that occur in similar numbers in plot 5. Species A reproduces sexually and species B reproduces asexually. After exposing both weed populations to several applications of the herbicide, the student observes that the population of species B has become significantly smaller than the population of species A.

    Why did species A most likely have a survival advantage over species B?

    A. There was greater genetic variability in species A than there was in species B.

    B. The percentage of herbicide-resistant weeds decreased in species A but not in species B.

    C. Asexual reproduction allows the weeds to produce more offspring in a shorter period of time.

    D. Sexually reproducing weeds are better able to utilize nutrients from the herbicides than asexually reproducing weeds.

36. Which biotic factor could have had an influence on the results of the students' experiment?

    A. the amount of precipitation each plot received

    B. the presence of plant-eating insects in the plots

    C. the lack of herbicide application in two of the plots

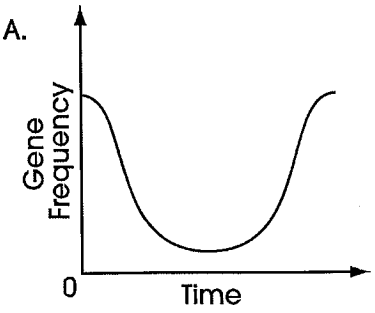
    D. the length of time allowed between counting the weeds

37. Based on the results of this experiment, a farmer has decided to use a 150% application of the herbicide to kill weeds in his fields. Describe one advantage and one disadvantage of using the 150% dose of herbicide. Respond in the space provided in your **Answer Document**. (2 points)

38. A single weed in plot 6 has a genetic mutation that allows its cells to transport herbicide out through the cell membrane before the weed is harmed. Suppose a student allows weeds to grow in plot 6 and then periodically treats them with herbicide.

Which graph best represents the expected frequency of the mutant gene in the weed population over time?

A.



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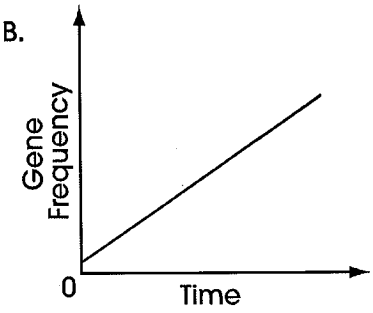
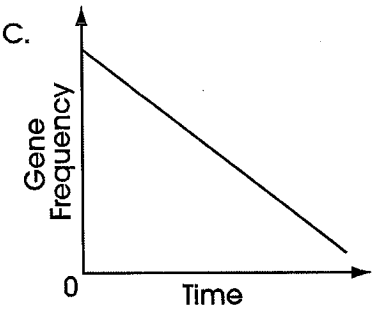
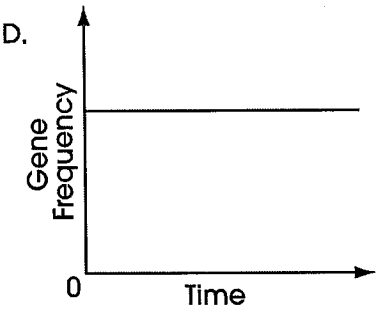


C.



D.



39. What evidence has been used to support the theory of plate tectonics?

A. The Grand Canyon runs in the same direction as the mid-Atlantic ridge.

B. There are deserts in the western parts of North and South America.

C. The same fossil species are found in South America and Africa.

D. Glacial till covers parts of the northern United States and Asia.

40. Engineers are designing an auditorium that will be used for performances by orchestras.

What must they do to maximize the loudness of the sound heard by the audience?

A. hang curtains behind the orchestra

B. put carpet all around the walls of the auditorium

C. hang reflecting panels from the ceiling behind the orchestra

D. install narrow glass windows and skylights around the top of the walls

41. A teacher dropped one light ball and one heavy ball simultaneously from the roof of a school building. Both balls struck the ground at the same time.

The students correctly concluded from this experiment that falling objects

A. lose mass as they fall.

B. are influenced by the height of the building.

C. do not accelerate under the influence of gravitational force.

D. accelerate at the same rate, regardless of mass, due to the force of gravity.

42. In his investigations of air, Henry Cavendish discovered a small bubble of leftover gas that would not combine with nitrogen. His observations went unnoticed until William Ramsay performed experiments in which he obtained similar results. Ramsay recalled and repeated Cavendish's experiments exactly to verify the results. Then, using Gustav Kirchhoff's spectroscopy technique, Ramsay was able to identify the leftover gas as the element he called argon. Upon further investigation, he found the elements neon, krypton and xenon.

Based on this information, it can be said that

A. the combined work of Cavendish, Kirchhoff and Ramsay led to the discovery of the noble gases.

B. Kirchhoff's work was insignificant in the investigations leading to the discovery of argon.

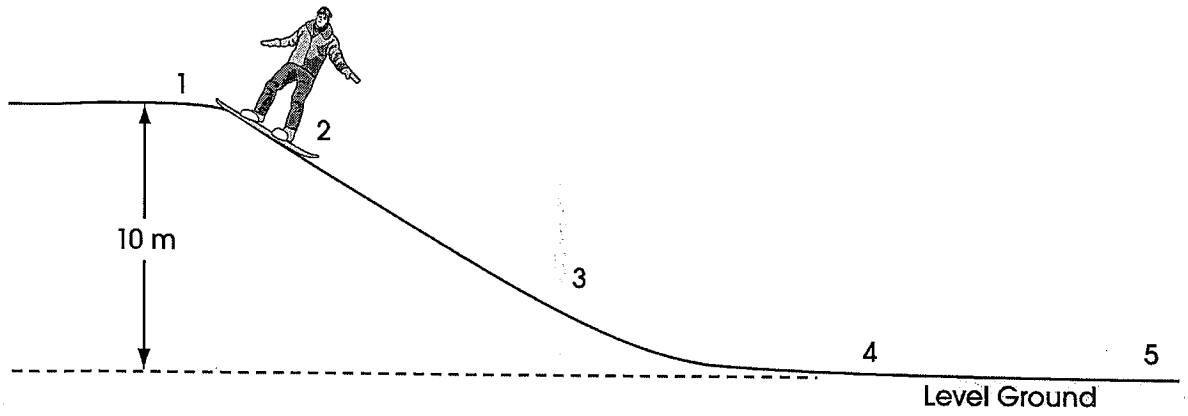
C. Ramsay violated ethical practice in science by repeating Cavendish's experiments.

D. Cavendish is directly responsible for the discovery of argon, but not neon, krypton or xenon.

Use the information and illustration to answer question 43 and 44.

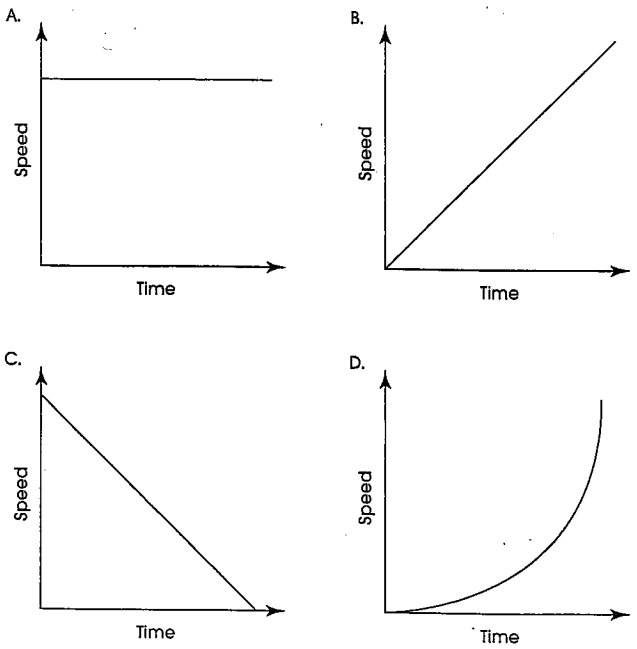
Snowboarding Science

A snowboarder begins his run from rest (point 1) on top of a hill. He moves straight down the slope until he reaches the bottom of the hill (point 4) and the ground levels off. The snowboarder continues to move horizontally across the level ground and eventually comes to a stop (point 5).



43. Using the same board, the snowboarder decides to make another run down the hill to see if he can increase his speed. Describe one thing the snowboarder could do to increase his speed on the slope. Explain why this would cause his speed to increase. Respond in the space provided in your **Answer Document**. (2 points)

44. Which graph best represents the speed of the snowboarder as he moves from point 2 to point 3?



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Blizzard Bag #3: OGT Review

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