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Science

HiSET® Exam Free Practice Test FPT2

Released 2015

Directions

This is a test of your skills in analyzing science information. Read each question and decide which of the four alternatives best answers the question. Then mark your choice on your answer sheet. Sometimes several questions are based on the same material. You should carefully read this material and then answer the questions.

Work as quickly as you can without becoming careless. Do not spend too much time on any question that is difficult for you to answer. Instead, skip it and return to it later if you have time. Try to answer every question even if you have to guess.

Mark all your answers on the answer sheet. Give only one answer to each question.

If you decide to change one of your answers, be sure to erase the first mark completely.

Be sure that the number of the question you are answering matches the number of the row of answer choices you are marking on your answer sheet.

1. Emily found a helium-filled balloon floating a few feet above the floor with its string dragging on the floor. She then did the following.

   I. She lifted the string of the balloon gently off the floor and noticed that the balloon started to rise.

   II. She said, "I think the balloon cannot lift the whole length of string. If I cut the string shorter, the balloon should rise."

   III. She cut the string very short.

   IV. Seeing that the balloon then rose, she said, "I think I was right."

   At which point did Emily formulate a hypothesis?

   A.　I
   B.　II
   C.　III
   D.　IV

2. If a person sits in a shadow and observes a narrow beam of sunlight from the proper angle, particles of dust in the air can usually be seen. Which of the following is the correct explanation for the phenomenon?

   A. The particles cast tiny shadows that the eye can detect.
   B. The particles reflect sunlight, which allows them to be seen.
   C. The particles give off ultraviolet light that can be seen under those conditions.
   D. The particles absorb the light, which causes them to glow.

GO ON TO THE NEXT PAGE ➡

3. Consider the following information.

A large number of scientists were asked to identify the factor that they believed was the major cause of extinction of a particular animal species. The percentages of the scientists indicating certain factors are shown below.

Hunting by humans	40.2%
Climate factors	42.6%
Other factors	17.2%

Which of the following is the most reasonable inference to draw from these percentages?

A. Climate was the major cause.

B. A factor other than climate and hunting was the major cause.

C. There is evidence to support both human factors and climatic factors as major causes.

D. The scientists were not basing their responses on valid observations.

4. The Sun maintains its high expenditure of energy by nuclear fusion reactions. These reactions convert the Sun's mass into both heavier elements and radiation. What is the probable long-range consequence of this process?

A. A constant increase in the Sun's temperature

B. A progressive decrease in the distance between the Sun and its planets

C. A gradual increase in intensity of solar disturbances on Earth

D. The eventual extinction of the Sun as a source of heat and light

Questions 5 to 7 refer to the information below.

Alleles are the different forms of the gene for a trait. For a certain breed of dog, the long hair allele (H) is dominant and the short hair allele (h) is recessive. For this breed, the genes of two parents and the possible gene combinations in their offspring are shown in the chart below.

Female Parent

		h	h
Male Parent	H	Hh	Hh
	h	hh	hh

5. Which of the following best describes the hair of the two parents?

  A. The male parent has long hair, and the female parent has short hair.

  B. The male parent has short hair, and the female parent has long hair.

  C. Both parents have short hair.

  D. Both parents have long hair.

6. Which of the following predictions about the hair of the offspring of these two parents is supported by the chart?

  A. None will have short hair.

  B. About $\frac{1}{4}$ will have short hair.

  C. About $\frac{1}{2}$ will have short hair.

  D. About $\frac{3}{4}$ will have short hair.

7. If the female parent had one long hair allele (H), what would be the expected percent of offspring with long hair?

  A.   100%

  B.   75%

  C.   50%

  D.   25%

Questions 8 to 10 refer to the information below.

The figure below classifies fish.

1   2   3   4

```
                    | 1 2 3 4 |  Fish
                        /    \
    Fin on Top   | 1 3 4 |   | 2 |  Fin on Top
    and Bottom               Only
                    /    \
       Stripes  | 1 3 |  | 4 |  No Stripes
       Present               Present
              /    \
  Eyespot on | 3 |  | 1 |  No Eyespot
  Body                    on Body
```
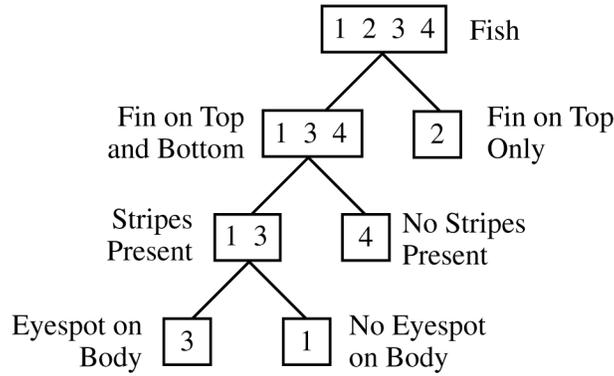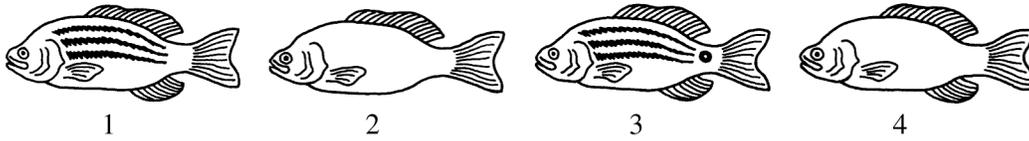
8. Which of the following are the major characteristics on which the classification system is based?

    A. Shape and size
    B. Color and habitat
    C. Movement and function
    D. Structure and markings

9. In how many levels are fish 1 and 4 grouped together?

    A. 1
    B. 2
    C. 3
    D. 4

10. Which of these pairs of fish are most similar according to the classification scheme?

    A. 1 and 2
    B. 1 and 3
    C. 2 and 3
    D. 2 and 4

Questions 11 to 17 refer to the information below.

Two scientists investigated the effects of various sounds on bees. They used special equipment to generate sounds of various frequencies inside a beehive that had been constructed with glass sides. The loudness of the sounds was kept constant. The results of the scientists' investigation are summarized in the table below.

Sound Frequency (Hertz [Hz] = cycles per second)	Change in Activity Level
20 Hz to 300 Hz	No change in normal activity level
300 Hz to 500 Hz	Activity level greatly reduced from normal
500 Hz to 800 Hz	Bees became motionless
800 Hz to 1,000 Hz	Activity level greatly reduced from normal
1,000 Hz to 20,000 Hz	No change in normal activity level

When the sound was discontinued, the bees immediately returned to their normal activity level. Also, bees approaching the entrance to the hive did not respond to the sound until after they had entered the hive.

11. What was the major question investigated in the experiment?

A. Do sounds of different loudnesses affect the activity level of bees?

B. Do humans and bees react to sounds in the same way?

C. Do sounds of different frequencies affect the activity level of bees?

D. Do humans and bees hear sounds in the same range of frequencies?

12. A scientist hypothesized that bees cannot perceive sounds below 300 Hz. How do the results of the experiment relate to the scientist's hypothesis?

A. The results are consistent with the hypothesis but do not prove it.

B. The results are inconsistent with the hypothesis but do not disprove it.

C. The results prove that the hypothesis is true.

D. The results prove that the hypothesis is not true.

13. Humans can hear frequencies ranging from 20 to 20,000 Hz. The results of the experiment provide the strongest support for which of the following statements?

A. Bees are sensitive to sound frequencies over the entire human range.

B. Bees are most sensitive to low frequency (300 to 1,000 Hz) sounds in the human range.

C. Bees are most sensitive to sound frequencies in the middle of the human range (1,000 to 10,000 Hz).

D. Bees are most sensitive to high frequency (10,000 to 20,000 Hz) sounds in the human range.

14. If the bees were tested at a frequency below 20 Hz, which of the following results would be most likely?

    A. The bees' activity level would increase.
    B. The bees' activity level would be normal.
    C. The bees would become motionless.
    D. The bees' activity level would decrease, but they would not become motionless.

15. Based on the results of the experiment, which of the following statements best describes the relationship between sound frequency and activity level in bees?

    A. As frequency increases, activity level increases.
    B. As frequency increases, activity level decreases.
    C. As frequency increases, activity level increases and then decreases.
    D. As frequency increases, activity level decreases and then increases.

16. The two scientists predicted that if the bees were tested at a frequency of 40,000 Hz, the following outcome would be observed.

    > The bees would gradually become motionless and would probably not return to their normal activity level.

    Which of the following would be the most likely explanation for this prediction?

    A. The high frequency would damage the bees' sound sensors or affect their ability to move.
    B. The high frequency would put the bees to sleep.
    C. The bees would become accustomed to the high frequency.
    D. The bees would not sense the high-frequency sound.

17. As part of the experiment, the scientists observed that the bees produced unique sounds depending on what they were doing. On the basis of the information, a student made the following statement:

    > Bees communicate with one another by sound.

    The statement is best described as

    A. a fact
    B. an observation
    C. a tentative hypothesis
    D. a conclusion based on experimental evidence

Questions 18 to 24 refer to the information below.

In order to investigate factors influencing the flow of granular materials such as sand, researchers used the hourglass-shaped apparatus pictured below. Very small glass beads, which had been washed and dried, were placed in the top chamber of the hourglass. The top chamber was then sealed shut. The beads passed through the hourglass and fell into a cup on a balance. A computer recorded the mass of the fallen beads over time.
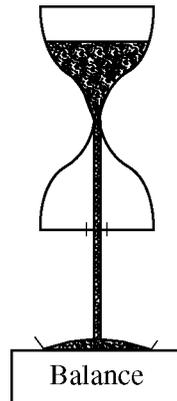
Glass beads with diameters from 0.17 to 1.00 millimeter (mm) flowed smoothly through the hourglass, but smaller and larger beads did not. Smaller beads fell in a series of little avalanches, with a short pause in the bead flow after each avalanche. This periodic pausing in the bead flow is referred to as ticking. Data from two sizes of beads that ticked are graphed below.
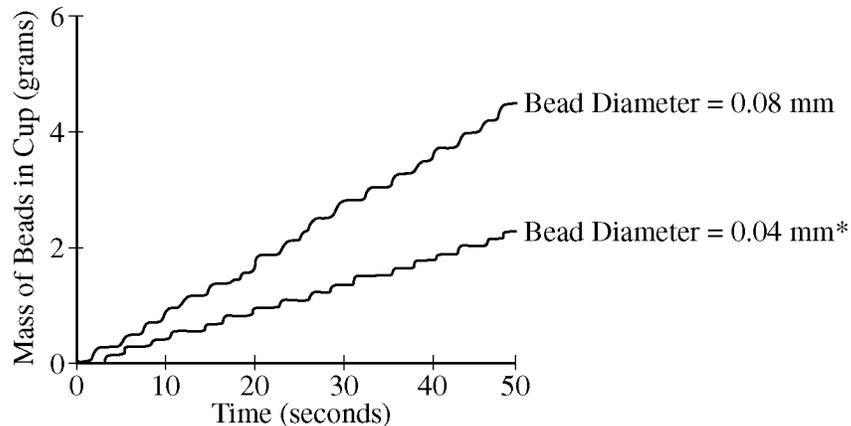
* The mass data for the 0.04 mm beads were multiplied by 5.

Whenever there was a pause in the bead flow, air pockets were observed moving up through the beads in the top chamber. The researchers hypothesized that each avalanche caused a small decrease in the air pressure in the top chamber, which stopped the bead flow until air could filter up from the bottom chamber. They found that closing the bottom chamber and warming it slightly with their hands could stop the bead flow. They also found that when both chambers were open to the outside air, the beads flowed without ticking.

18. An experimental variable is a factor that is systematically varied so that its effects can be observed. Which of the following was the experimental variable in the experiment?

   A. Time for the hourglass to empty
   B. Mass of the beads in the cup
   C. Rate of ticking
   D. Diameter of the beads

19. For the 0.04 mm beads, how often did the beads tick?

   A. About 2 times every second
   B. About 4 times every second
   C. About once every 3 seconds
   D. About once every 6 seconds

20. The beads flowed without ticking when both the top and bottom chambers were open. What is the most likely explanation for the observation?

   A. Moisture from the air helped the beads stick together.
   B. Moisture from the air gave more weight to the beads.
   C. Air pockets moved down through the beads.
   D. Air pressure remained about the same in both chambers.

21. Which of the following most likely explains why the mass data for the 0.04 mm beads were multiplied by 5 before the data were graphed?

   A. To adjust for errors in the computer values when very small beads were used
   B. To make the number of ticks appear more frequent
   C. To prevent the two graphs from overlapping
   D. To make it easier to compare the two graphs

22. Assume the researchers' hypothesis is true. What would happen if the air pressure in the top chamber was always greater than the air pressure in the lower chamber?

   A. The periodic pausing (ticking) would still occur, but less frequently.
   B. The periodic pausing (ticking) would still occur, but more frequently.
   C. The beads would flow without periodic pausing (ticking).
   D. The beads would not flow at all.

23. If glass beads with a diameter of 0.50 mm were placed in the hourglass, what would most likely occur?

   A. The beads would flow smoothly.
   B. The beads would not flow at all.
   C. The beads would flow a little and then stop completely.
   D. The beads would flow a little, stop for a few seconds, and then start to flow again.

24. Based on the researchers' hypothesis, which of the following best explains why warming the closed bottom chamber stopped the bead flow?

   A. It caused the air pressure in the bottom chamber to decrease.
   B. It caused the air pressure in the bottom chamber to increase.
   C. It caused the air pressure in both the top and bottom chambers to decrease.
   D. It caused the air pressure in both the top and bottom chambers to increase.

25. Since the speed of light is greater than the speed of sound, <u>a lightning bolt is seen before the thunder is heard</u>. The underlined part of the sentence is best described as

   A. a theory
   B. a hypothesis
   C. an observation
   D. an assumption

STOP

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Science Practice Test
Answer Key

Question Number	Correct Answer	Question Difficulty	Question Type
1	B	Easy	Physical Science
2	B	Easy	Physical Science
3	C	Easy	Earth Science
4	D	Difficult	Earth Science
5	A	Easy	Life Science
6	C	Easy	Life Science
7	B	Easy	Life Science
8	D	Easy	Life Science
9	B	Easy	Life Science
10	B	Easy	Life Science
11	C	Easy	Life Science
12	A	Difficult	Life Science
13	B	Medium	Life Science
14	B	Easy	Life Science
15	D	Medium	Life Science
16	A	Easy	Life Science
17	C	Difficult	Life Science
18	D	Difficult	Physical Science
19	C	Difficult	Physical Science
20	D	Difficult	Physical Science
21	D	Medium	Physical Science
22	C	Difficult	Physical Science
23	A	Difficult	Physical Science
24	B	Difficult	Physical Science
25	C	Medium	Earth Science

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