

# Science Passage Practice Questions

1. In 1949, a study of heart disease included 5,137 adults: 2,292 men and 2,845 women. All the individuals were 49 to 70 years of age, and none showed any signs of coronary artery disease. After 14-16 years of careful follow-up, it was found that:

I. 151 men and 37 women showed evidence of coronary artery disease that would account for a heart attack.

II. 102 men and 18 women died of coronary artery disease before they reached the age of 65.

III. 58 percent of the men and 39 percent of the women died within one hour of having a heart attack.

IV. For both men and women, sudden death was more likely if they were under age 55 at the time of the attack.

V. Not all heart attacks produce symptoms. A considerable number of men and women had a myocardial infarction (heart muscle damage) without knowing it. Of those who suffered such "silent coronaries"; 22 percent of the men and 35 percent of the women did not know muscle damage had occurred.

In the design of this study, the researchers made sure that

- A. some individuals had coronary artery disease
- B. some individuals were in their thirties
- C. the number of men and women was equal
- D. all participants were adults

2. As explained in the study, a person who has a "silent coronary"

- A. is unaware of any heart attack symptoms
- B. does not scream in pain while having a heart attack
- C. shows no evidence of heart muscle damage
- D. always dies of a myocardial infarction

3. A woman who is 53 years old has a heart attack. Compared with a man, she is more likely to

- A. die of coronary artery disease before age 65
- B. have a "silent coronary"
- C. die within an hour of the attack
- D. die as the result of a heart attack after age 65

4. Which conclusion is consistent with the results of the study?

- A. Chances of death within one hour of a heart attack are greater for women than men.
- B. Chances of death from coronary artery disease are less for men than women.
- C. Evidence of coronary artery disease is equal among men and women.
- D. Sudden death is more likely for both men and women if they are under age 55 at the time of the attack.

5. Based on the results of this experiment, of the people who died of coronary artery disease before age 65

- A. 18 percent were women
- B. 20 percent were women

- C. 85 percent were men
- D. 102 percent were men

6. A group of 1000 men and 1200 women between the ages of 50 and 65 are to be studied for coronary artery disease. Based on the original study, which of the following results could be predicted most reliably?

- A. Eight (8) women will die of coronary heart disease after they reach age 65.
- B. Sixteen (16) women will show significant evidence of coronary artery disease.
- C. Forty-four (44) men will die of coronary artery disease after they reach age 65.
- D. Sixty-five (65) men will show no significant evidence of coronary artery disease.

7. A chemistry student placed a strip of blue litmus paper and a strip of pink litmus paper in a glass dish. Then she added a drop of dilute sulfuric acid to each strip of litmus paper. She observed that the blue litmus paper turned pink, but the pink litmus paper did not change color. Next she placed a drop of sodium hydroxide (NaOH) on other strips of blue and pink litmus paper. This time, the pink litmus paper turned blue, but the blue litmus paper did not change. Finally, she put a drop of distilled water on strips of blue and pink litmus paper. Neither strip changed color. She repeated the tests several times with the same results. The student concluded that acids turn blue litmus paper pink; bases, such as sodium hydroxide, turn pink litmus paper blue. As water did not affect either pink or blue litmus paper, she reasoned that water was not an acid or a base, but a neutral substance.

Keeping these results in mind, the student poured a little sodium hydroxide into a beaker containing pink and blue litmus paper. Then she added hydrochloric acid (HCl) drop by drop until the solution became neutral. She determined that a new, neutral substance had formed in the beaker. The substance was table salt, or sodium chloride (NaCl), which is one of many salts formed from an acid and a base.

If a drop of an unknown substance turns blue litmus paper pink, but does not change pink litmus paper, the substance is a(n):

- A. acid
- B. base
- C. water
- D. salt

8. In the presence of potassium hydroxide (KOH):

- A. blue litmus paper turns pink
- B. pink litmus paper turns blue
- C. blue litmus paper becomes darker
- D. pink litmus paper does not change

9. When strips of blue and pink litmus paper are put in a beaker filled with a clear solution, neither litmus paper changes color. The solution:

- A. must be water
- B. must be neutral
- C. may be an acid
- D. may be a base

10. In another experiment, the student added hydrochloric acid drop by drop to a solution of sodium hydroxide containing strips of originally blue and originally pink litmus paper. As she continued adding acid, the originally:

- A. pink litmus paper remained pink
- B. blue litmus paper remained blue
- C. blue litmus paper turned from pink back to blue
- D. pink litmus paper turned from blue back to pink

11. Based on the results of this experiment, a salt would be formed when:

- A. NaCl is combined with NaOH
- B. H<sub>2</sub>O is combined with HCl
- C. KOH is combined with HCl
- D. HCl is combined with H<sub>2</sub>OSO<sub>4</sub>

12. In setting up an aquarium, several factors must be considered before introducing fish. Which of the following factors could be tested using litmus paper?

- A. salinity
- B. acidity
- C. chlorination
- D. temperature

13. The complex behavior of the poor-sighted, three-spined male stickleback fish has been studied extensively as a model of species behavior in courtship and mating. After a male has migrated to a suitable spot, he builds a spawning nest of sand and sediment. In courting, he performs a special "zigzag" dance. The female then follows the male to the nest where she spawns and he fertilizes the spawned eggs. Also, male sticklebacks have been shown to exhibit territorial behaviors. A biologist performed three experiments to learn more about the behavior of the stickleback.

#### Experiment 1

Tank 1 and Tank 2 are set up with identical conditions and one male stickleback is placed in each tank. Both fish build nests in their respective tanks. The male from Tank 1 is removed from his tank and is replaced with an egg-laden female; the male from Tank 2 is removed from his tank and is introduced into Tank 1. In Tank 1, the male does not perform the zigzag dance and no spawning occurs. The male retreats to a corner of the tank.

#### Experiment 2

A male stickleback in an aquarium builds his nest. A fat, round male is introduced into the environment. The original male performs the zigzag dance and attempts to lead the round male to the nest. The round male refuses and begins to flap his fins and swim in circles. The first male then begins to flap his fins, circle his nest, and occasionally prod the other fish to a far corner of the tank.

#### Experiment 3

A small, flat-shaped female is introduced into a tank where a male has built a nest. The male circles the female a few times, and then retreats to a corner of the tank.

The experimental data would support the hypothesis that the purpose of the male stickleback's mating dance is to:

- A. keep away other male sticklebacks.
- B. fertilize the eggs.
- C. lure and entice the female to the nest
- D. establish territorial rights.

14. Based on observations from the above experiments, which factor initially stimulates the male to do the zigzag dance?

- A. The physical environment.
- B. The shape of the fish.
- C. The number of fish in the tank.
- D. The sex of the fish.

15. Which experiment supports the hypothesis that the male exhibits territorial behavior?

- A. 1 only.
- B. 2 only.
- C. 1 and 2 only.
- D. 1, 2, and 3.

16. To further investigate the territorial behavior of the stickleback, the biologist should vary which of the following factors in Experiment 2?

- A. The temperature of the water.
- B. The fatness of the male fish.
- C. The sediment and sand in the tank.
- D. The size of the tank.

17. To clarify the results of Experiment 1, the biologist should set up which of the following test situations?

- A. Maintain the positions of the male sticklebacks and add another egg-laden female to Tank 1.
- B. Place both male sticklebacks in Tank 2.
- C. Return the original male stickleback to Tank 1 and observe its behavior with the female fish.
- D. Repeat the experiment using a different species of fish.

18. A male stickleback has been established in an aquarium and has built a nest. If one egg-laden female and several flat-shaped male sticklebacks are placed in the tank, one would most likely observe:

- A. all the males would perform the zigzag dance.
- B. all the males would circle the female.
- C. only the male that was originally in the tank would perform the zigzag dance.
- D. the female would retreat to a corner.