

# ACT Assessment 9954D

## Answers and Explanations

### SCIENCE TEST

#### Passage I – “Research Methods”

1. D. By referring to Table 1, and looking at the columns of Mass and Aggressiveness, there is no pattern between the cricket’s weight and level of aggressiveness. Therefore, an assumption can be made that weight is not a factor in the dominance hierarchy.
2. J. Refer to Table 3 and determine which cricket had the greatest number of losses. Cricket E had 95 losses.
3. C. This question is a “what if” question that requires you to add the data about a 6<sup>th</sup> cricket to Table 1. By re-charting, in ascending order, the aggressiveness and adding the 6<sup>th</sup> cricket’s 23 chirps to the data in descending order, the rank of the 6<sup>th</sup> cricket is clearly 4.
4. G. There is no correlation between the mass or age and the number of chirps made. However, as aggressiveness increases the number of chirps decreases. Only III – Aggressiveness – is a factor.
5. D. Refer to Table 2 and look up the number of times the winning cricket D lost to cricket E, which is 15. Then look up the number of times the winning cricket E lost to cricket D: which is 10. Add all the encounters together (15+10) for a total of 25.
6. H. Refer to Table 1 and chart, in ascending order, the age of crickets and their corresponding weight:

1	.4
2	.1
3	.5
4	.2
5	.3

As soon as you chart the mass of the 1 day old cricket, the only chart that could be correct is H since the mass is on the upper end of the graph.

#### Passage II – “Conflicting Viewpoints”

7. D. Scientist 1 states “this increase of CO<sub>2</sub> ... has increased global temperatures” so the chart must show an increase of both global temperatures and atmospheric CO<sub>2</sub> levels.

8. F. Eliminate G since Scientist 1 states that the use of coal and oil are the problems of global warming. Eliminate answers H and J since nuclear power plants or chlorofluorocarbons are never mentioned. Since Scientist 1 states that burning forests adds CO<sub>2</sub> and also decreases the number of plants that would remove CO<sub>2</sub> from the air, it can be assumed that a viable solution would be to reforest large areas of the planet.
9. C. Scientist 1 does not discuss the effect CO<sub>2</sub> has on global warming or cooling. Scientist 2 states that particles in the atmosphere “actually cools Earth slightly”.
10. H. Since burning forests increases CO<sub>2</sub>, and an increase of CO<sub>2</sub> in the air has increased global warming, the scientist states one result of global warming is a rise of sea levels.
11. D.
12. G. The first sentence of Scientist 2’s views state “CO<sub>2</sub> has not caused global warming.”
13. D. Since Scientist 2 claims

### Passage III – “Data Representation”

14. H. By referring to Table 1, the gas and effusion time columns, you can subtract the effusion times between the indicated gases:

$$F. 7.2 - 5.1 = 2.1$$

$$G. 22.5 - 14.2 = 8.3$$

$$H. 27.4 - 14.2 = 14.2$$

$$I. 19.2 - 18.2 = 1$$

15. B. Refer to Table 1: both effusion time and molecular mass steadily increase.
16. F. H<sub>2</sub>’s effusion time of 5.1 seconds is the lowest, meaning it takes the least amount of time for the gas to move thru a fine opening, (as stated in the introduction), thereby making the balloon filled with H<sub>2</sub> the first to deflate.
17. C. Refer to Table 1 and note that the charted effusion time of CO<sub>2</sub> is 22.5 seconds. 11.25 seconds is exactly ½ of the stated effusion time of 22.5, so ½ or 50% of the gas molecules remain.
18. J. Refer to Table 1 and determine that H<sub>2</sub>’s effusion time of 5.1 is 1/3 of the stated 15.3 seconds. By looking at the passage underneath Figure 1, it states a 25 ml gas sample was used. The unknown volume must be 3 times greater than the sample, or 25 ml x 3 = 75 ml.

### Passage IV – “Data Representation”

19. A. By looking at the O ppt column, and comparing the Standard Kit A the chart shows O<sub>2</sub> has the same salinity of 7.3.
20. J. Looking under chloride the Standard, Kits A & B all increase as the salinity increases.
21. D. First determine if Kit A is more accurate than Kit B by comparing both Kits to the Standard for NH<sub>3</sub>. Kit B is more similar to the Standard, so the answer must be “no” – eliminating answers A and B.
22. H. The first point graphed must start high since Kit A is 41.4; automatically eliminating graphs G and J. Looking across Kit A steadily decreases until 30 ppt when it dramatically increases from 7.9 to 41.8.
23. B. By adding the data provided for O<sub>2</sub>, CaCO<sub>3</sub> and NH<sub>3</sub> to Kit A on the chart it is apparent that the salinity falls between 0 and 5 ppt, resulting in the best answer of 3 ppt.

### Passage V – “Research Methods”

24. J. Refer to Table 2 and look in the grain diameter column for a diameter of 2 mm or larger. 10 mm is the only one larger found in site 4.
25. D. Refer to Table 3 and look at the bedform descriptions. “Sediment completely removed” is found at a water velocity of 120 cm/sec.
26. F. By reading the introduction it becomes apparent that the reason for the experiments was to examine bedforms.
27. A. The question being asked is: “Why does sediment stay at the bottom?”. By process of elimination and deductive reasoning the best answer emerges.
28. G. Utilize data from Table 3, particularly where small ripples were formed: (grain of .5 mm and water velocity of 40 cm/sec).
29. C. This question requires you to add the new data to the existing Table 2. Looking at all the data provided, you are unable to find a pattern; meaning water depth has no influence.

### Passage VI – “Data Representation”

30. G. The x-axis on a chart is the horizontal axis. The y-axis is the vertical axis.
31. B. Figure 2 shows a steady increase of light as electrodes emitted increases. Figure 3 does not show an increase or decrease, so answers C and D must be eliminated. Figure 1 does not measure intensity of light.

32. H. First determine if the answer is yes or no by referring to the steady line of the chart in Figure 3. Answers F and G can be eliminated since the chart does not indicate and increase. Answer J is wrong because the line would slope upward if it were indicating an increase.
33. A. You must use both Figure 3 and Figure 1 to chart the answer. Figure 3 shows that the maximum electron energy is almost 3. By looking at Figure 1 and determining where a 6.5 frequency intersects near electron energy 3 you see that Metal A. is the correct answer.
34. J. Refer to Figure 1 and compare the graphing of Metal A to Metal D. Pick a point of maximum electron energy (2) and read across to where Metal A intersects (5 frequency) and Metal D intersects (10 frequency). Metal D requires twice as much frequency as Metal A.

### Passage VII – “Research Methods”

35. D. Refer to Table 2 and compare Trials 10 to 11. Notice that all variables are constant except weight suspended and frequency. Although frequency is different (300 and 150), weight suspended is a much greater variance (900 and 225).
36. G. The only variable that would produce a constant tension would be the weight suspended.
37. D. Refer to Table 2 and compare the weight suspended (900) to frequency (300) of trial 10. Note that weight suspended is 3 times greater. If the new weight suspended is 3600, then the frequency must be  $\frac{1}{3}$  of that or 600.
38. F. By comparing the column of frequency and the other variables cited in each answer, you are able to work through and eliminate answer choices.
39. B. Refer to Trials 8-11 on Table 2 since they are all nylon. Find the lowest frequency (75) and read the chart to find the highest mass.
40. F. Use Table 1 since the question is referring to steel string. This question requires you to add the provided information to the existing chart and look for a pattern. By adding a “Trial 7A” and using the numbers provided, a pattern will emerge that shows the vibrating length to be .5.