

## Questions on Topic Five: Exploring Categorical Data

### Multiple-Choice Questions

**Directions:** The questions or incomplete statements that follow are each followed by five suggested answers or completions. Choose the response that best answers the question or completes the statement.

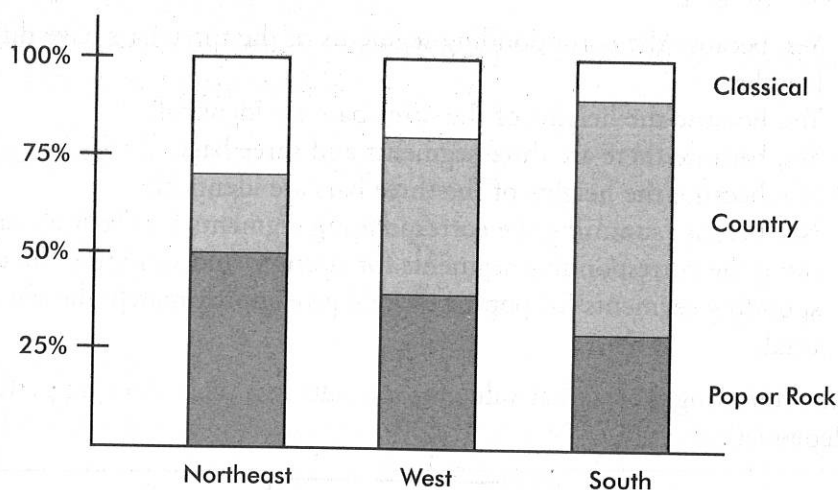
Questions 1–5 are based on the following: To study the relationship between party affiliation and support for a balanced budget amendment, 500 registered voters were surveyed with the following results:

	For	Against	No opinion
Democrat	50	150	50
Republican	125	50	25
Independent	15	10	25

1. What percentage of those surveyed were Democrats?  
(A) 10%  
(B) 20%  
(C) 30%  
(D) 40%  
(E) 50%
2. What percentage of those surveyed were for the amendment and were Republicans?  
(A) 25%  
(B) 38%  
(C) 40%  
(D) 62.5%  
(E) 65.8%
3. What percentage of Independents had no opinion?  
(A) 5%  
(B) 10%  
(C) 20%  
(D) 25%  
(E) 50%

4. What percentage of those against the amendment were Democrats?
  - (A) 30%
  - (B) 42%
  - (C) 50%
  - (D) 60%
  - (E) 71.4%
5. Voters of which affiliation were most likely to have no opinion about the amendment?
  - (A) Democrat
  - (B) Republican
  - (C) Independent
  - (D) Republican and Independent, equally
  - (E) Democrat, Republican, and Independent, equally

Questions 6–10 are based on the following: A study of music preferences in three geographic locations resulted in the following segmented bar chart:



6. What percentage of those surveyed from the Northeast prefer country music?
  - (A) 20%
  - (B) 30%
  - (C) 40%
  - (D) 50%
  - (E) 70%
7. Which of the following is greatest?
  - (A) The percentage of those from the Northeast who prefer classical.
  - (B) The percentage of those from the West who prefer country.
  - (C) The percentage of those from the South who prefer pop or rock.
  - (D) The above are all equal.
  - (E) It is impossible to determine the answer without knowing the actual numbers of people involved.

8. Which of the following is greatest?
- (A) The number of people in the Northeast who prefer pop or rock.
  - (B) The number of people in the West who prefer classical.
  - (C) The number of people in the South who prefer country.
  - (D) The above are all equal.
  - (E) It is impossible to determine the answer without knowing the actual numbers of people involved.
9. All three bars have a height of 100%.
- (A) This is a coincidence.
  - (B) This happened because each bar shows a complete distribution.
  - (C) This happened because there are three bars each divided into three segments.
  - (D) This happened because of the nature of musical patterns.
  - (E) None of the above is true.
10. Based on the given segmented bar chart, does there seem to be a relationship between geographic location and music preference?
- (A) Yes, because the corresponding segments of the three bars have different lengths.
  - (B) Yes, because the heights of the three bars are identical.
  - (C) Yes, because there are three segments and three bars.
  - (D) No, because the heights of the three bars are identical.
  - (E) No, because summing the corresponding segments for classical, summing the corresponding segments for country, and summing the corresponding segments for pop or rock all give approximately the same total.
11. In the following table, what value for  $n$  results in a table showing perfect independence?

20	50
30	$n$

- (A) 10
- (B) 40
- (C) 60
- (D) 75
- (E) 100

12. A composition of 100 percent of the age of that the percent male executives

- (A) No
- (B) No
- (C) No
- (D) A
- (E) I

## Answer

- 1. E
- 2. A
- 3. E

## Answer

- 1. (E)  
250  
500
- 2. (A)  
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- 3. (E)  
and
- 4. (E)  
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- 5. (C)  
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- 6. (A)  
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12. A company employs both men and women in its secretarial and executive positions. In reports filed with the government, the company shows that the percentage of female employees who receive raises is higher than the percentage of male employees who receive raises. A government investigator claims that the percentage of male secretaries who receive raises is higher than the percentage of female secretaries who receive raises, and that the percentage of male executives who receive raises is higher than the percentage of female executives who receive raises. Is this possible?
- (A) No, either the company report is wrong or the investigator's claim is wrong.
  - (B) No, if the company report is correct, then either a greater percentage of female secretaries than of male secretaries receive raises or a greater percentage of female executives than of male executives receive raises.
  - (C) No, if the investigator is correct, then by summation of the corresponding numbers, the total percentage of male employees who receive raises would have to be greater than the total percentage of female employees who receive raises.
  - (D) All of the above are true.
  - (E) It is possible for both the company report to be true and the investigator's claim to be correct.

### Answer Key

- |      |      |      |       |
|------|------|------|-------|
| 1. E | 4. E | 7. B | 10. A |
| 2. A | 5. C | 8. E | 11. D |
| 3. E | 6. A | 9. B | 12. E |

### Answers Explained

1. (E) Of the 500 people surveyed,  $50 + 150 + 50 = 250$  were Democrats, and  $\frac{250}{500} = .5$  or 50%.
2. (A) Of the 500 people surveyed, 125 were both for the amendment and Republicans, and  $\frac{125}{500} = .25$  or 25%.
3. (E) There were  $15 + 10 + 25 = 50$  Independents; 25 of them had no opinion, and  $\frac{25}{50} = .5$  or 50%.
4. (E) There were  $150 + 50 + 10 = 210$  people against the amendment; 150 of them were Democrats, and  $\frac{150}{210} = .714$  or 71.4%.
5. (C) The percentages of Democrats, Republicans, and Independents with no opinion are 20%, 12.5%, and 50%, respectively.
6. (A) In the bar corresponding to the Northeast, the segment corresponding to country music stretches from the 50% level to the 70% level, indicating a length of 20%.