國立中央大學 108 學年度碩士班考試入學試題

所別： 資訊管理學系 碩士班 丙組(一般生)　　共12頁 第1頁

科目： 統計學

本科考試禁用計算器

選擇題，共 40 題，每題 2.5 分。請作答於答案卷上。

1. The descriptive measure of dispersion that is based on the concept of a deviation about the mean is

A. the range
B. the interquartile range
C. both a and b
D. the standard deviation
E. None of the above answers is correct.

2. The difference between the largest and the smallest data values is the

A. variance
B. interquartile range
C. range
D. coefficient of variation
E. None of the above answers is correct.

3. Which of the following is not a measure of central location?

A. mean
B. median
C. variance
D. mode
E. None of the above answers is correct.

4. If a data set has an even number of observations, the median

A. can not be determined
B. is the average value of the two middle items
C. must be equal to the mean
D. is the average value of the two middle items when all items are arranged in ascending order
E. None of the above answers is correct.

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5. The sum of deviations of the individual data elements from their mean is

A. always greater than zero
B. always less than zero
C. sometimes greater than and sometimes less than zero, depending on the data elements
D. always equal to zero
E. None of the above answers is correct.

6. The value that has half of the observations above it and half the observations below it is called the

A. range
B. median
C. mean
D. mode
E. None of the above answers is correct.

7. The most frequently occurring value of a data set is called the

A. range
B. mode
C. mean
D. median
E. None of the above answers is correct.

8. In a sample of 800 students in a university, 160, or 20%, are Business majors. Based on the above information, the school's paper reported that "20% of all the students at the university are Business majors." This report is an example of

A. a sample
B. a population
C. statistical inference
D. descriptive statistics
E. None of the above answers is correct.

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9. A statistics professor asked students in a class their ages. On the basis of this information, the professor states that the average age of all the students in the university is 21 years. This is an example of

A. a census
B. descriptive statistics
C. an experiment
D. statistical inference
E. None of the above answers is correct.

10. A tabular summary of a set of data showing the fraction of the total number of items in several classes is a

A. frequency distribution
B. relative frequency distribution
C. frequency
D. cumulative frequency distribution
E. None of the above answers is correct.

11. The standard deviation of a sample of 100 observations equals 64. The variance of the sample equals

A. 8
B. 10
C. 6,400
D. 4,096
E. None of the above answers is correct.

12. The variance of a sample of 81 observations equals 64. The standard deviation of the sample equals

A. 0
B. 4096
C. 8
D. 6,561
E. None of the above answers is correct.

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13. Which of the following is not a measure of dispersion?

A. the range
B. the 50th percentile
C. the standard deviation
D. the interquartile range
E. the variance

14. If the variance of a data set is correctly computed with the formula using n - 1 in the denominator, which of the following is true?

A. the data set is a sample
B. the data set is a population
C. the data set could be either a sample or a population
D. the data set is from a census
E. None of the above answers is correct.

15. In computing descriptive statistics from grouped data,

A. data values are treated as if they occur at the midpoint of a class
B. the grouped data result is more accurate than the ungrouped result
C. the grouped data computations are used only when a population is being analyzed
D. All of the above answers are correct.
E. None of the above answers is correct.

16. The measure of dispersion that is influenced most by extreme values is

A. the variance
B. the standard deviation
C. the range
D. the interquartile range
E. None of the above answers is correct.

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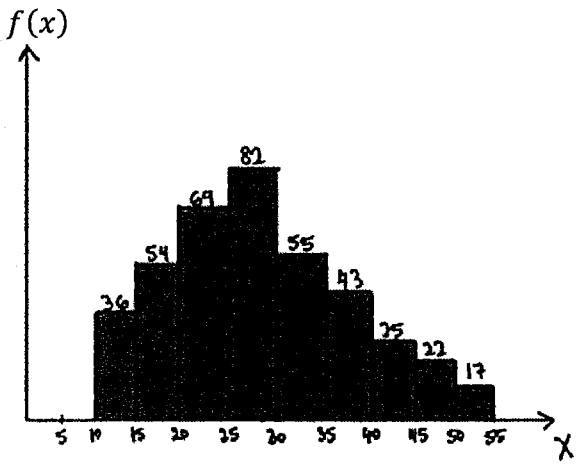
17. When should measures of location and dispersion be computed from grouped data rather than from individual data values?

A. as much as possible since computations are easier
B. only when individual data values are unavailable
C. whenever computer packages for descriptive statistics are unavailable
D. only when the data are from a population
E. None of the above answers is correct.

18. If a positively skewed distribution has a median of 50, which of the following statement is true?

A. Mean is greater than 50
B. Mean is less than 50
C. Mode is less than 50
D. Mode is greater than 50
E. Both A and C
F. Both B and D

19. Which of the following is a possible value for the median of the below distribution?



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A. 32
B. 26
C. 17
D. 40

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20. Which of the following statements are true about Bessels Correction while calculating a sample standard deviation?

1. Bessels correction is always done when we perform any operation on a sample data.
2. Bessels correction is used when we are trying to estimate population standard deviation from the sample.
3. Bessels corrected standard deviation is less biased.

A. Only 2

B. Only 3

C. Both 2 and 3

D. Both 1 and 3

21. If the variance of a dataset is correctly computed with the formula using (n – 1) in the denominator, which of the following option is true?

A. Dataset is a sample
B. Dataset is a population
C. Dataset could be either a sample or a population
D. Dataset is from a census
E. None of the above

22. [True or False] Standard deviation can be negative.

A. TRUE

B. FALSE

23. Standard deviation is robust to outliers?

A. True

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B. False

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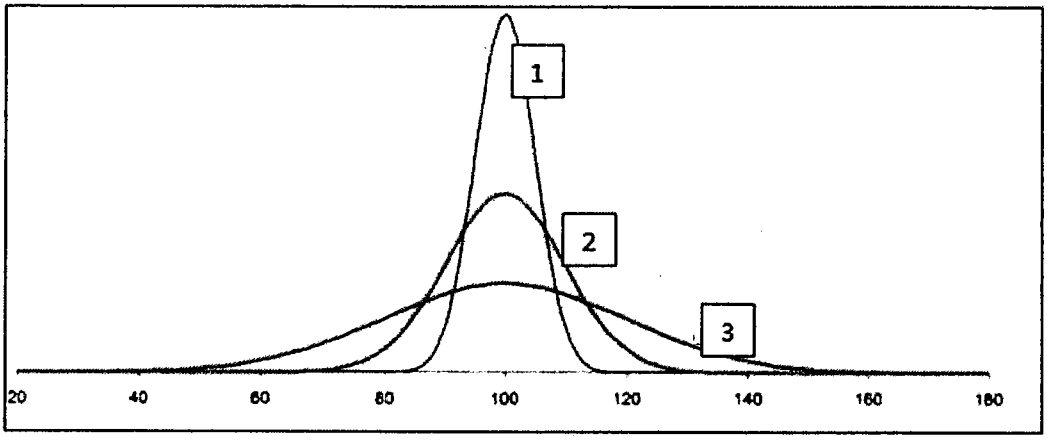
24. For the below normal distribution, which of the following option holds true ?

σ1, σ2 and σ3 represent the standard deviations for curves 1, 2 and 3 respectively.



A. σ1> σ2> σ3

B. σ1< σ2< σ3

C. σ1= σ2= σ3

D. None

25. What would be the critical values of Z for 98% confidence interval for a two-tailed test ?

A. +/- 2.33
B. +/- 1.96
C. +/- 1.64
D. +/- 2.55

26. [True or False] The standard normal curve is symmetric about 0 and the total area under it is 1.

A)TRUE

B. FALSE

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Context for Questions 27-29

Studies show that listening to music while studying can improve your memory. To demonstrate this, a researcher obtains a sample of 36 college students and gives them a standard memory test while they listen to some background music. Under normal circumstances (without music), the mean score obtained was 25 and standard deviation is 6. The mean score for the sample after the experiment (i.e With music) is 28.

27. What is the null hypothesis in this case?

A. Listening to music while studying will not impact memory.
B. Listening to music while studying may worsen memory.
C. Listening to music while studying may improve memory.
D. Listening to music while studying will not improve memory but can make it worse.

28. What would be the Type I error?

A. Concluding that listening to music while studying improves memory, and it's right.
B. Concluding that listening to music while studying improves memory when it actually doesn't.
C. Concluding that listening to music while studying does not improve memory but it does.

29. After performing the Z-test, what can we conclude ___ ?

A. Listening to music does not improve memory.

B. Listening to music significantly improves memory at p

C. The information is insufficient for any conclusion.

D. None of the above

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30. A researcher concludes from his analysis that a placebo cures AIDS. What type of error is he making?

A. Type 1 error

B. Type 2 error

C. None of thesE. The researcher is not making an error.

D. Cannot be determined

31. What happens to the confidence interval when we introduce some outliers to the data?

A. Confidence interval is robust to outliers

B. Confidence interval will increase with the introduction of outliers.

C. Confidence interval will decrease with the introduction of outliers.

D. We cannot determine the confidence interval in this case.

Context for questions 32- 34

A medical doctor wants to reduce blood sugar level of all his patients by altering their diet. He finds that the mean sugar level of all patients is 180 with a standard deviation of 18. Nine of his patients start dieting and the mean of the sample is observed to 175. Now, he is considering to recommend all his patients to go on a diet.

Note: He calculates 99% confidence interval.

32. What is the standard error of the mean?

A. 9
B. 6
C. 7.5
D. 18

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33. What is the probability of getting a mean of 175 or less after all the patients start dieting?

A. 20%
B. 25%
C. 15%
D. 12%

34. Which of the following statement is correct?

A. The doctor has a valid evidence that dieting reduces blood sugar level.

B. The doctor does not have enough evidence that dieting reduces blood sugar level.

C. If the doctor makes all future patients diet in a similar way, the mean blood pressure will fall below 160.

Question Context 35-37

A researcher is trying to examine the effects of two different teaching methods. He divides 20 students into two groups of 10 each. For group 1, the teaching method is using fun examples. Where as for group 2 the teaching method is using software to help students learn. After a 20 minutes lecture of both groups, a test is conducted for all the students.

We want to calculate if there is a significant difference in the scores of both the groups.

It is given that:

- Alpha=0.05, two tailed.
- Mean test score for group 1 = 10
- Mean test score for group 2 = 7
- Standard error = 0.94

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35. What is the value of t-statistic?

A. 3.191
B. 3.395
C. Cannot be determined.
D. None of the above

36. Is there a significant difference in the scores of the two groups?

A. Yes
B. No

37. What percentage of variability in scores is explained by the method of teaching?

A. 36.13
B. 45.21
C. 40.33
D. 32.97

38. [True or False] F statistic cannot be negative.

A. TRUE

B. FALSE

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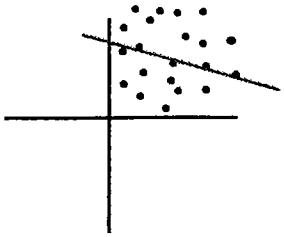
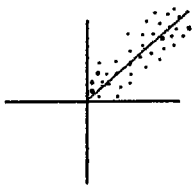
39. Which of the graph below has very strong positive correlation?

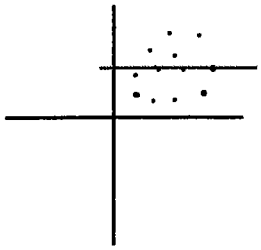
A)



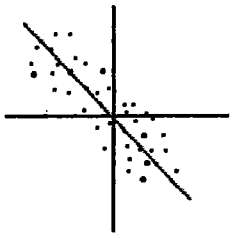
B)



C)



D)



40. Correlation between two variables (Var1 and Var2) is 0.65. Now, after adding numeric 2 to all the values of Var1, the correlation co-efficient will_____ ?

A. Increase

B. Decrease

C. None of the above

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