

Important Questions on Statistical Methods



1. Some statements are given about the measure of dispersion;
I) Amount of variability or dispersion from mean value of individual data is measured by standard deviation.
II) Standard error of mean or mean deviation measures how far is average sample data is likely to be from true mean of population.
III) The standard error of mean is always smaller than standard deviation.
Choose the correct option;
A. I
B. II & III
C. I&III
D. All of above
2. In a calculation from a moderately symmetrical distribution mean deviation is 32, then what is the value of standard deviation?
A. 60
B. 40
C. 5
D. 9
3. The measure of central tendency is?
A. Mean
B. The range
C. Standard deviation
D. The raw score
4. In statical methods, analysis of variance in population is done by comparing?
A. Mean
B. Variance
C. Standard deviation
D. None
5. Four statements are given about ANOVA;
I) It is a statical method which is used to check the significance of mean difference of two groups.
II) It is used to determine the variability of mean value of two groups.
III) It helps to find whether null hypothesis is accepted or rejected.
IV) It does not say about null hypothesis.
Which one is not correct?
A. I
B. II
C. III
D. IV
6. In a group of plant population, ANOVA is used to perform the comparison of proline producing ability. A table is given below for the same:

Source of variance	Degree of freedom	Some of Squares
Between Group	3	425
With in group	28	1960

F value should be:

- A. 9
B. 15
C. 5
D. 26

7. Which statement is true about the t- value in t-test?
 A. If t-value is large it shows significance difference between the group.
 B. Large t- value indicates mean difference between group is greater than pooled standard error.
 C. Both.
 D. None
8. Following formulae are given, which of these is used for calculation of the t-test?
 A. $t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{s^2(\frac{1}{n_1} + \frac{1}{n_2})}}$
 B. $\hat{H}\Psi = E\Psi$
 C. $\chi^2 = \sum \frac{(O_i - E_i)^2}{E_i}$
 D. None
9. Which of these is not a t-test?
 A. One sample test.
 B. Two sample test.
 C. Paired test.
 D. Multiple sequence alignment.
10. T-test is known as significance test; what type of assessment is done in t-test?
 A. In this test, median of two dependent group is assessed.
 B. In this test, mean of two independent group is assessed.
 C. In this test, mode of two independent variable is assessed.
 D. In this test, modes of three independent variable are assessed.

ANSWERS

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

SOLUTIONS

1. Ans. D.

Amount of variability or dispersion from mean value of individual data is measured by standard deviation. Standard error of mean or mean deviation measures how far is the average sample data likely to be from true mean of population. The standard error of mean is always smaller than standard deviation.

2. Ans. B.

In symmetrical distribution, mean deviation = 4/5 of standard deviation, then;

Mean deviation (32) = 4/5 standard deviation

Standard deviation= 40

3. Ans. A.

In central tendency, main measures are mean, mode and median; these help to find the middle or average of any data set.

4. Ans. D.

Analysis of variance ANOVA is a statistical tool that analyses aggregate variability in data. In this test mean value is compared.

5. Ans. D.

ANOVA is a statistical method which is used to check the significance of mean difference of two groups. It is used to determine the variability of mean value of two groups, and it helps to find whether null hypothesis is accepted or rejected.

6. Ans. C.

In ANOVA difference between continuous variable in more than two groups is detected. F ratio is ratio between two group variance within the group which is represented as:

$F = \frac{\text{between the group variance}}{\text{within the group variance}}$

Between the group variance = Sum of square (between)/Degree of freedom
 $425/3 = 141.6$

Within the group = Sum of square/degree of freedom

$1960/28 = 70$

$F = 141.6/28 = 5$

7. Ans. C.

In t-test comparison of mean value in two groups is performed, in which large t-value indicates the difference between two group mean is greater than the pooled standard value. This indicates that significant difference between the two group is more.

8. Ans. A.

Option A shows the correct formula of t-test wherein, t denotes the t value, X_1 and X_2 shows the mean group which is to be compared, and n_1 n_2 shows the number of comparisons in each group. Option B is formula of Schrodinger equation, and option C is formula of chi square test.

9. Ans. D.

When the group comes from a single population, then to compare paired t test is performed. When comparison of groups is to be performed if they come from two different populations, then two sample t-test or independent test is performed. When the comparison of one group is done against standard value, then one sample t- test is performed.

Multiple sequence alignment is a process of comparison of nucleotide and protein sequence bioinformatically; it is not a t-test.

10. Ans. B.

In the statistical test known as t-test; comparison of mean of two independent test is performed. This test is normally used for testing the hypothesis in population or two assets that two groups are different from one another.



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