1708E282 Candidate's Seat No : _____

B.Sc. (Sem.-5) Examination
STA 304 Statistics
Design of Experment

Time : 2-00 Hours]   **July 2021**   **[Max. Marks : 50**

Instruction : (1) All questions in section-I carry equal marks.
(2) Attempt any three questions in section I
(3) Questions-IX in section II is compulsory.

SECTION I

1 (a) State a linear model for one way classification. Also give its layout, assumptions and ANOVA table 7
(b) In usual notations derive expected value of total sum of square of one way analysis of variance. 7

2 (a) State linear model for two way analysis of variance, state hypothesis and assumptions and 7
lay out associated with two way analysis of variance.
(b) Derive expectedvalue of treatmentsum of squares for two way classification. 7

3 (a) Explain : Randomization, Replication and local control. 7
(b) Explain : Experimental unit, treatment, variety and Experimental Error. 7

4 (a) Write a note an completely Randomised design. State its merits and demerits. 7
(b) Give layout and statistical analysis of completely Randomised Design. 7

5 (a) Give layout and state merits and demerits of Randomised Block design. How do you identify 7
that given design is a Randomised Block design?
(b) Drive the formula to estimate two missing yields in Randomised Block design. 7

6 (a) Give statistical Analysis of latin square design. 7
(b) Derive the efficiency of laton square design over Randomised Block design. 7

7 (a) Explain in detail factorial experiments. 7
(b) For 2^2 factorial experiment, derive main and interaction effects. 7

8 (a) Define Yate'sprocedure for 2^3 factorial experiments. 7
(b) Define confounding, total and partial confounding giving appropriate example. 7

SECTION II

9 Attempt any Eight : 8
(1) In one way ANOVA, degree of freedom of treatment is. (a) k-1 (b) k-2 (c) k-3 k-4
(2) In one way ANOVA, degree of freedom of error is. (a) N-2k (b) N-k (c) N (d) k
(3) In two way ANOVA, degree of freedom of treatment is (a) k (b) N (c) k-1 (d) p
(4) In two way ANOVA, degree of freedom of error.
(a) (h-1) (k-1) (b) (h-1) (k-2) (c) (h-2) (k-1) (d) hk-1
(5) In ANOVA the comparison of the estimates are done with the help of.............
(a) F-test (b) t-test (c) z-test (d) None of the above

[P.T.O.

(6)   The basic assumptions made in ANOVA are
    (a) All the observations are independent
    (b) Parent populations from which observations are taken is normal
    (c) Various effects are additive in nature
    (d) All of the above

(7)   What are the two types of variance which can occur in your data in ANOVA
    (a) Between and wittin groups
    (b) Personal and interpersonal
    (c) Repeated and extraneous
    (d) None of the above

(8)   In ANOVA, treatment refers.
    (a) Experimetal units (b) A factor
    (c) Different levels of a factor (d) Applying anfibiotics to a wound

(9)   Analysis of variance is a statistical method of comparing the .... of several populations.
    (a) Mean (b) Variance (c) Statistical deviation (d) None of the above

(10) The error deviation within the S.S.T. Statistics measures distances.
    (a) Within groups (b) Between groups (c) Both of the above (d) None of the above

(11) As variability due ti chance decreases the value of F will ....
    (a) Increase (b) Decrease (c) Remains the same (d) None of the above

(12) When conducting an ANOVA F calculated vlaue will fall within what rage?
    (a) Between $-\infty$ and ∞ (b) Between 0 and 1 (c) Between 0 and ∞ (d) Between 1and ∞

(13) In one way ANOVA, which of the following statement is correct?
    (a) There is no interaction
    (b) An interaction can be tested
    (c) An interaction is present
    (d) There are multiple interaction

(14) The full from of ANOVA is
    (a) Analysis of variance
    (b) Analytics of variance
    (c) Analysis of variation
    (d) None of the above

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