

2025

PSYCHOLOGY — HONOURS

Paper : DSCC-11

(Statistical Methods for Psychological Research - II)

Full Marks : 75

*The figures in the margin indicate full marks.**Candidates are required to give their answers in their own words as far as practicable.*

1. Write notes on (*any five*) (word limit **250** each) : 5×5
- One tailed and two tailed test
 - Standard Error
 - Degrees of Freedom
 - Advantages of confidence intervals
 - Null and Alternative Hypothesis
 - Properties of sampling distribution
 - Power of a test
 - Levels of significance.
2. Answer *any two* questions (word limit **700** each) :
- Explain with examples the differences between parametric and non-parametric tests. 10
 - Write a note about standard error in hypothesis testing. 10
 - Write down the steps of statistical inference. 10
 - Write down the difference between *t*-distribution and normal probability distribution. Write down the assumptions of *t*-test. 3+7
 - The following are observations obtained for two samples :

Sample 1	3.9	4.3	4.7	3.7	4.2	4.1	4.8	5.3	4.9	5.2	5.5
Sample 2	4.8	3.6	4.5	3.9	4.6	4.0	3.8				

Test the significance of difference between two samples.

$$\text{Critical } U_{.02(11, 7)} = 12 \quad \text{10}$$

Please Turn Over

(4121)

3. Answer *any two* questions (word limit **1000** each) :

- (a) Define analysis of variance. Discuss the differences between the *t*-test and the *F*-test. Write down the assumptions of *F*-test. 4+3+8
- (b) Define 'u-test'. State the assumptions and uses of *u*-test. Differentiate between *t*-test and *u*-test. 3+8+4
- (c) What is Randomized group one-way ANOVA? State its assumptions. Apply one-way ANOVA to find whether or not there is a significant difference between the mean tracheal ventilation scores (ml/min) of the following two groups of beetles treated respectively with two different doses of a pesticide. Interpret the results. 2+3+10

Group 1	80	81	75	80	88	70	74	71	84	72
Group 2	70	74	68	67	72	59	61	57	68	54

Critical F values :

$$F_{.05}(1, 18) = 4.41; F_{.01}(1, 18) = 8.28$$

$$F_{.05}(1, 19) = 4.38; F_{.01}(1, 19) = 8.18$$

$$F_{.05}(1, 20) = 4.35; F_{.01}(1, 20) = 8.10$$

- (d) The following are paired observations obtained for a sample of eight subjects under two conditions :

Condition A	8	17	12	19	5	6	20	3
Condition B	12	31	17	17	8	14	25	4

Considering normality of the distribution test the significance of difference between two means. 15

Critical values	0.05	0.01
<i>df</i> = 7	2.365	3.499
<i>df</i> = 8	2.306	3.355
<i>df</i> = 9	2.262	3.250

- (e) A personality inventory is administered in a private school to 8 boys whose conduct records are exemplary, and to 5 boys whose records are very poor. Data are given below :

Group 1	110	112	95	105	111	97	112	102
Group 2	115	112	109	112	117			

Critical values	0.05	0.01
<i>df</i> = 11	2.201	3.106
<i>df</i> = 12	2.179	3.055
<i>df</i> = 13	2.160	3.012

Is there any significant difference between the groups?

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