2025

(FYUGP)

(4th Semester)

PSYCHOLOGY

(MAJOR)

Paper : C–PSY–08

(Statistical Methods for Psychological Research—II)

Full Marks : 75

Pass Marks : 40%

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. *(a)* Define hypothesis testing and levels of significance. Explain the various steps of hypothesis testing.   2+5+8=15

Or

(b) A music teacher claimed that all new trainees in the music school are above average in music aptitude. A random sample of 30 new trainees have a mean music aptitude of 112·5 and the

population mean music aptitude score is 100. The standard deviation is 15. Is there sufficient evidence to support the hypothesis that all new trainees have above average music aptitude? Test at the 5% level of significance. 15

2. (a) A researcher wants to compare the effectiveness of two teaching methods. A group of 20 students is divided in two equal groups and taught using different methods. After a test, the mean score are recorded as follows :

| Method A | 78 | 82 | 85 | 79 | 88 | 91 | 74 | 80 | 77 | 83 |
| Method B | 70 | 75 | 72 | 78 | 68 | 74 | 71 | 76 | 69 | 73 |

Perform an independent samples T-test at a 0·05 level of significance and state your conclusion. 15

Or

(b) Two independent samples were taken to compare the average test score of two groups of students. Calculate the hypothesis testing for the difference between two independent means : 15

Group	Sample size (n)	Sample mean (x)	Sample variance
1	15	82	10
2	12	76	8

3. (a) Elucidate the types and factors of ANOVA. Compare the *T*-test and *F*-test in terms of their applications and interpretation. Critically explain the basis of one-way analysis of variance.

5+5+5=15

Or

(b) Calculate a one-way ANOVA to determine the test score. Whether there is a significant difference in the mean test scores of students from three different teaching methods. Consider significance level of 0·05 :   15

Method 1	Method 2	Method 3
85	79	90
90	88	95
87	82	89
93	75	94
87	72	93

4. (a) What is chi-square test? Explain the calculation of a chi-square goodness of fit test with an example.   5+10=15

Or

(b) A supermarket wants to know if customer payment method (cash, card or digital wallet) is independent or

(*Turn Over*)

the age group. A survey of total 300 customers provided the following data. Perform a chi-square test for independence : 15

Age	Cash	Card	Digital wallet	Total
Young	50	30	20	100
Middle age	40	60	50	150
Old age	30	20	0	50
Total	120	110	70	300

5. (a) Explain the role of SPSS in statistics. Discuss its key uses and how it facilitates data analysis in non-parametric testing. 3+12=15

Or

(b) Discuss the advantages and disadvantages of non-parametric tests. Explain the different types of non-parametric test. 7+8=15

★ ★ ★