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Your Roll No.

M.A. / II Sem.

A

PSYCHOLOGY – Paper 201

Statistics and Experimental Design

(Admissions of 2009 and onwards)

Time : 3 Hours

Maximum Marks : 38

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

*All questions are compulsory. Questions 1 to 4 carry 8
marks each and Question 5 carries 6 marks.*

1. (a) Discuss the application of moments in testing the normality of the distribution.
- (b) Differentiate between bi-serial and point-bi-serial correlation coefficients.

Or

Find the value of partial correlations and multiple correlations from the following bi-variate correlations

$$r_{12}=0.40, r_{13}= 0.60, r_{23} = 0.55$$

[P.T.O.]

2. On the basis of pretest on a cancellation test the subjects were divided into 6 blocks of 5 subjects each. Within each block the 5 subjects were assigned randomly to the 5 treatments. The outcome of the experiment is presented below. Analyze and find if the treatment effect is significant.

Blocks	T1	T2	T3	T4	T5
A	15	18	18	20	22
B	17	18	20	24	25
C	20	22	20	24	26
D	22	25	26	28	29
E	21	26	28	31	32
F	24	26	29	33	35

Or

Six subjects were administered treatments repeatedly in a single factor repeated measure design. Determine if the treatment differ significantly. Also determine the trend.

Subjects	T1	T2	T3	T4
1	10	13	8	10
2	17	10	10	12
3	14	10	11	14
4	10	14	15	12
5	13	11	12	14
6	11	10	8	13

3. (a) Partition the sum of squares and degrees of freedom for a $4 \times 4 \times 4 \times 5$ repeated measure design on the last factor having 6 subjects in each.
- (b) Interpret graphically $SS_{ab} = 0.0$ and $SS_{abc} \neq 0.0$ for a $4 \times 5 \times 4$ factorial design.

Or

- (a) Partition the sum of squares and degree of freedom for a $5 \times 4 \times 4$ factorial repeated measure design on the last one factor with $n = 6$.
- (b) Calculate the sum of square of $A \times C$ for the above design from the data given below :

	C1	C2	C3	C4
A1	45	55	50	45
A2	45	65	55	60
A3	30	40	45	55
A4	34	40	50	65
A5	45	40	35	50

4. In an experiment with five treatment conditions, the F has been found to be significant. The MS error is 64, associated df is 20 and $n = 5$. Apply suitable technique to find differences among the following means :
21.5, 18.8, 25.9, 24.5, 20.0.

Or

Twenty five subjects were assigned randomly to the treatments in a 5×5 Latin Square Design. The rows and columns effect were also controlled. The outcome of the experiment, together with the square is given below :

A	B	C	D	E	15	16	19	27	25
C	D	E	A	B	14	19	18	14	27
D	E	A	B	C	16	17	18	27	26
E	A	B	C	D	17	14	16	16	28
B	C	D	E	A	15	15	17	27	29

Compute ANOVA

5. Write short notes on any two of the following :
- Greco-Latin Square design
 - Phi-Correlation
 - ANCOVA