

CARMEL COLLEGE OF ARTS, SCIENCE AND COMMERCE, NUVEM-GOA
M.A. (PSYCHOLOGY) EXAMINATION, JANUARY 2022
PLC 104: ADVANCED STATISTICS FOR PSYCHOLOGY

Duration: 3 Hours

Total Marks: 60

Instructions: 1) All questions are compulsory.

2) Figures to the right indicate marks.

Q.NO. IA. Write short notes on any two of the following: 05

- i) Standard Deviation
- ii) Estimation theory
- iii) Median

Q.NO. IB. Write an essay on any one of the following: 10

- i) The methods of extraction and rotation are central to Factor Analysis. Elucidate.
- ii) Define a hypothesis. Explain the process of hypothesis testing.

Q.NO. IIA. Write short notes on any two of the following: 05

- i) Kendall's Tau
- ii) Multiple regression
- iii) Partial correlation

Q.NO.IIB. Solve any one of the following: 10

- i) A researcher collected data on externalizing behaviours and anxiety. Find out whether there is a relationship between the two variables and comment on the value.

Externalizing behaviours	9	7	7	3	11	6	2	6	6	9
Anxiety	37	23	26	21	42	33	26	35	23	28

- ii) In an experiment, a researcher was interested to know as to whether any relationship exists between the marks obtained in history and intelligence of the subjects. Students were classified into low and high IQ groups and their marks in history obtained in the undergraduate examination were recorded. The data so obtained is shown in the following table.

Marks in history	46-50	51-55	56-60	61-65	66-70	71-75	76-80	81-85
High IQ	2	3	4	15	10	12	6	8
Low IQ	8	4	9	6	9	3	2	4

Compute the biserial correlation (Value of $y = 0.3928$).

Q.NO. IIIA. Write short notes on any two of the following:

05

- i) Wilcoxon sign rank test
- ii) Two-way ANOVA
- iii) Chi square

Q.NO. IIIB. Solve any one of the following:

10

- i) A human-factors psychologist studied three computer keyboard designs. Three samples of individuals were given material to type on a particular keyboard and the number of errors committed by each participant as recorded. The data are as follows:

Keyboard A	0	4	0	1	0
Keyboard B	6	8	5	4	2
Keyboard C	6	5	9	4	6

Is there a significant difference in the typing performance? Compute an ANOVA at 0.01% (Table value = 6.93).

- ii) A researcher interested in evaluating environmentally friendly behaviours evaluated how often people recycle (per month) based on whether they have an overall optimistic or an overall pessimistic attitude toward eco-friendly behaviours. The results from this hypothetical study are given in the table below. Use an appropriate parametric test to determine whether or not recycling behaviours differed between groups at 0.01% level of significance. (Critical value = 2.921).

Pessimistic	3	0	4	2	5	4	3	0	2
Optimistic	4	9	6	8	7	5	3	3	6

Q.NO.IVA. Write short notes on any two of the following:

05

- i) Exploratory Factor Analysis
- ii) Advantages of Factor Analysis
- iii) Use of SPSS for Factor Analysis

Q.NO.IVB. Write an essay on any one of the following

10

- i) The time (in minutes) that rats took to go through a maze was noted for three groups of rats. Using an appropriate non-parametric test, analyze whether there are differences between the groups. (Critical Value = 5.991).

Untreated	Stimulant	Hallucinogen
1	8	19
8	16	18
23	9	15
20	2	17
21	6	23
7	7	24

- ii) A psychologist is interested in determining whether left-handed and right handed people differ in spatial ability. She randomly selects left-handers and right-handers from the students enrolled in the university and administers a test that measures spatial ability. The following are the scores. Compute the Mann-Whitney test (Table value = 20)

Left-handers	87	94	56	74	98	83	92	84	76	
Right-handers	47	68	92	73	71	82	55	61	75	85

