

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION DECEMBER 2023
(Fifth Semester)
Branch – STATISTICS

EDUCATIONAL & PSYCHOLOGICAL STATISTICS

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 1 = 5)

- 1 The relationship between two variables partialling out the effect that a third variable has on one of those variables can be expressed using a:
 - (i) Partial correlation
 - (ii) Semi-partial correlation
 - (iii) Bivariate correlation
 - (iv) Point-biserial correlation
- 2 Normalised standard scores are generally called:
 - (i) T.Scores
 - (ii) F. Scores
 - (iii) C. Scores
 - (iv) None of these
- 3 Which is NOT a type of standard score?
 - (i) stanine
 - (ii) $T\sqrt{score}$
 - (iii) $C\sqrt{score}$
 - (iv) $J\sqrt{score}$
- 4 Which of the following is true of test-retest reliability?
 - (i) The test is measuring what it claims to be measuring
 - (ii) The test will produce consistent results
 - (iii) The client will improve performance second time/round
 - (iv) All the above
- 5 Construct validity is a notation that refers to
 - (i) The notation that scores on a test correlate highly with scores from tests that measure the same attribute.
 - (ii) The level of which a construct is related to other similar measures.
 - (iii) The degree to which the items in the test consistently relate to each other.
 - (iv) The test will produce consistent results.

SECTION - B (15 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks

(5 x 3 = 15)

- 6 a Following data provides the year of service of 12 salesman and order of merit (Efficiency) given by sales manager. Calculate Rank difference correlation:

Salesmen	A	B	C	D	E	F	G	H	I	J	K	L
Years of service	5	2	10	8	6	4	12	2	7	5	9	3
Order of Merit (Efficiency)	6	12	1	9	8	5	2	10	3	7	4	11

OR

- b What is point biserial correlation? How is it different from biserial correlation? How it is computed?
- 7 a Briefly explain standard scores.
- OR
- b Write the common scaling procedures that are used in psychology and education.
- 8 a Write the merits and demerits of C-scale.
- OR
- b Write the procedure for converting raw scores in to stanine score.

Cont...

- 9 a Write a short note on parallel form method.
OR
b Show that the reliability ρ_k of a test at length k in terms of its reliability ρ_h at length h is given by $\rho_k = \frac{k\rho_h}{h+(k-h)\rho_h}$.
- 10 a What is the effect of the lengthening of a test on validity?
OR
b Is it true that a test can have high reliability and low validity? If so, explain how?

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks (5 x 6 = 30)

- 11 a What is tetrachoric correlation? When is it computed? Discuss its computation process.
OR
b Find the multiple linear regression equation of X_1 on X_2 and X_3 from the data relating to three variables given below:

X_1	4	6	7	9	13	15
X_2	15	12	8	6	4	3
X_3	30	24	20	14	10	4

- 12 a Find the T-Scores corresponding to the test scores X for the following frequency distribution:

X:	1	2	3	4	5	6	7
Y:	5	10	20	5	4	4	2

OR

- b What are σ and Z scores? How can you transform raw scores into such standard scores? Illustrate with example.
- 13 a Letter grades A,B,C,D,E (A being the highest and E the lowest) are assigned by two teachers X and Y to the students of class for "Honesty". The data given below is the distribution of the proportion of individuals in each rating.

Honesty→ Teacher↓	A	B	C	D	E
X	0.10	0.15	0.50	0.20	0.05
Y	0.20	0.40	0.20	0.10	0.10

(Table value: $Z_1=1.28$, $Z_2=0.675$, $Z_3=-0.675$, $Z_4=-1.645$)

Find the numerical scores corresponding to each grade and each teacher.

OR

- b What are C-scores? How can you construct C-scales? What are their importance?
- 14 a Give a brief account of the Test-Retest Method of determining test of Reliability.
OR
b The reliability coefficient of a test of 50 items is 0.60.
i) How much this test should be lengthened to raise the self-correlation to 0.90?
ii) What effect with the (i) doubling?
iii) Trebling the test's length has upon the reliability coefficient?
iv) What is the reliability of a test having 125 comparable items?
- 15 a Discuss the different types of validity.
OR
b Compare reliability and Validity.