

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

PG DEGREE EXAMINATION DECEMBER 2023
(Third Semester)

TRANS DISCIPLINARY COURSE
(Common to PG Programmes)

STATISTICAL TECHNIQUES

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions
ALL questions carry EQUAL marks (5 x 1 = 5)

1. Two types of research data include
(i) Recognised and unrecognised data (ii) Structured and unstructured data
(iii) Qualitative and quantitative data (iv) Organised and processed data
2. The mean and variance for Poisson distribution is
(i) both are equal (ii) both are not equal
(iii) mean greater than variance (iv) mean less than variance
3. A quantity obtained by applying a certain rule or formula is known as
(i) sample (ii) test statistic
(iii) estimate (iv) estimator
4. The degrees of freedom for chi-square test statistic when testing for independence in a contingency table with five rows and five columns
(i) 8 (ii) 25
(iii) 10 (iv) 16
5. Student's t-distribution has (n-1) d.f. when all the n observations in the sample are
(i) dependent (ii) independent
(iii) increasing (iv) decreasing

SECTION - B (15 Marks)

Answer ALL Questions
ALL Questions Carry EQUAL Marks (5 x 3 = 15)

- 6 a Define Statistics and point out its importance in the field of business and commerce.
OR
b What is a Statistical enquiry?
- 7 a Define Normal distribution.
OR
b Ten coins are thrown simultaneously. Find the probability of getting at least seven heads.
- 8 a Define a consistency and unbiasedness estimators.
OR
b Explain the term (i) point estimation and (ii) interval estimation.
- 9 a Explain critical region and level of significance.
OR
b Explain the various steps to follow in testing of a statistical hypothesis.
- 10 a Explain the application of t-distribution.
OR
b Explain the Construction of t-test for single mean.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

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

- 11 a Explain a random sample. How do you select a random sample from a finite population?
OR
b Explain the various methods of sampling.
- 12 a In a book of 520 pages, 390 typo-graphical errors occur. Find the probability that a random sample of 5 pages will contain no error.
OR
b Let X is a normal variate with mean 30 and S.D 5. Find the probabilities that
(i) $26 \leq X \leq 40$ and (ii) $X \geq 45$

- 13 a A tree consists of hundreds of apples. 46 apples are randomly chosen. The mean and standard deviation of this instance is found to be 86 and 6.2 respectively. Determine the confidence interval at 95%.
OR
b. 400 labourers were selected at random from a certain district. Their mean income was 140.5 rupees per month, with standard deviation 25.2 rupees. Find the 95% confidence limits within which the income of the labour community of district is expected to lie.

- 14 a In a large city A, 20 per cent of a random sample of 900 school children had defective eye-sight. In other city B, 15 per cent of random sample of 1600 children had the same defect. Is this difference between the two proportions significant? Also obtain 95% confidence limits.

OR

- b A sample analysis of examination results of 200 school students was made. It was found that 46 students had failed, 68 secured a third division, 62 secured a second division and the rest were place in first division. Are these figures commensurate with the general examination result which is in the ratio of 4:3:2:1 for various categories respectively?
- 15 a A random sample of 10 boys had the following I.Q's: 70, 120, 110, 101, 88, 83, 95, 98, 107, 100. Do these data support the assumption of a population mean I.Q. of 100? Find a reasonable range in which most of the mean I.A. values of samples of 10 boys lie.

OR

- b Ten persons were appointed in a electrical position in an office. Their performance was noted by giving a test and the marks recorded out of 50. They were given 6 months training and again they were given a test and marks were recorded out of 50.

Employees	A	B	C	D	E	F	G	H	I	J
Before training	25	20	35	15	42	28	26	44	35	48
After training	26	20	34	13	43	40	29	41	36	46

Test at 5% level whether it can be concluded that employees have benefited by the training.

Z-Z-Z

END