(c) Write a note on the applications of student'st test.

$$(1+4)+5+4=14$$

8. (a) Define the following terms (any two)

(i) Level of significance

(ii) Consumers Risk vs Producer's Risk

(iii) Power of a test

(b) Two independent samples of 7 items had the following values

Sample I : 9 11 13 11 15 9 12

Sample II : 10 12 10 14 9 8 10

Test whether the difference between the means of samples of significant or not at 1% level of significance.

(c) Write a short note on Paired t test. $(2+2)+5+5=14$

UNIT - V

9. (a) What are non-parametric tests? Under what circumstances non-parametric tests are better measures of hypothesis testing in relation to parametric tests?

(b) Write a short note on sign test?

10. (a) What is Analysis of Variance? What are its assumptions? State the superiority of ANOVA over student's test as a tool of hypothesis testing.

(b) Explain the utility of Analysis of Variance aproach in empirical research. $2+3+3+6=14$

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PG (CBCS) EVEN SEMESTER EXAMINATION, 2023

ECONOMICS

2nd Semester

Course No. : ECOCC - 205 (O)

(Statistics for Economics)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

(Answer any five, selecting one from each unit)

UNIT - I

1. (a) Give two examples of spurious corrdation.

(b) Calculator correlation coefficient between X and Y for the following data and comment on the result.

X : 1 3 5 7 8 10

Y : 2 6 9 10 16 20

(c) Show that $I - R_{1.23}^2 = (1 - r_{12}^2)(1 - r_{13.2}^2)$ where the symbols have their usual meanings. $2+6+6=14$

2. (a) Distinguish between product moment correlation coefficient and rank correlation coefficient.

(b) The IQ's of a group of 6 persons were measured, and they were taken an examination. Their I.Q's and examination marks were as follows :

Pereson :	A	B	C	D	E	F
T.Q :	110	100	140	120	80	90
Exam marks:	70	60	80	60	10	20

(Turn Over)

Compute the rank correlation coefficient and comment on the result.

(c) Under what circumstance, value of rank correlation coefficient will be - 1? 4+8+2=14

UNIT - II

3. (a) The distribution function of a random variable X is given by

$$F(x) = \begin{cases} 1 - (1 + x)\, e^x, & for\ x \geq 0 \\ 0, & for\ x < 0 \end{cases}$$

Find the corresponding density function of random variable X.

(b) Let, X be a continuous random variable with probability density function given by

$$F(x) = \begin{cases} ax, & 0 \leq x \leq 1 \\ a, & 1 \leq x \leq 2 \\ -ax + 3a, & 2 \leq x \leq 3 \\ 0, & elsewhere \end{cases}$$

Determine the value of a.

(c) State the properties of Binomial distribution. Point out two differences between Binomial distribution and Poisson distribution. 3+5+(4+2)=14

4. (a) Define moment generating function.

(b) Find moment generating function of Poision distribution.

(c) A continuous random variable X has the following probability density function

f (x) = A + BX , $0 \leq x \leq 1$

If the mean of the distribution is 1/2 then find the values of A and B.

(d) If X ~ N (4, 36) then find the points of inflexion of the normal curve. 2+4+6+2=14

UNIT - III

5. (a) Distinguish between SRSWR and SRSWOR.

(b) Show that sample mean is an unbiased estimator of population mean in simple random sampling.

(c) Show that sample variance can be considered as an unbiased estimator of population variance in case of large samples. Is this result also true for small samples? Justify your answer. 4+5+(3+2)=14

6. (a) Distinguish between parameter and statistic.

(b) Define a consistent estimator.

(c) Define standard error. Add a note on the significance of standard error in hypothesis testing.

(d) Explain Yamene's method of sample size determination for a known population.

3+2+4+5=14

UNIT - IV

7. (a) What is a statistical hypothesis? Distinguish between null hypothesis and alternative hypothesis.

(b) An ambulance service claims that it takes on the average 8.9 minutes to reach its destination in emergency. Calls to check on this claim, the agency which licenses ambulance services has made them 50 emergency calls, getting a mean of 9.3 minutes with a standard deviation of 1.6 minutes. Test the claim of the ambulance service at 5% level of significance.