

ECONOMICS

(Honours)

(5th Semester)

Course No. : ECOH-502

Full Marks : 50

Pass Marks : 17

Time : 2 hours

Arts students will answer ECOH-502 (Arts) and
Science students will answer ECOH-502 (Science)

The figures in the margin indicate full marks
for the questions

GROUP—A

Course No. : ECOH-502 (Arts)

(For Arts Students)

(**Statistics for Economics—I**)

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. (a) State the essential points to be observed in drafting a questionnaire.
- (b) Throw light on the important steps in the construction of a frequency distribution.

5+5=10

(Turn Over)

Weight (gm)	: 110-119	120-129	130-139	140-149
Frequency	: 5	7	12	17
Weight (gm)	: 150-159	160-169	170-179	180-189
Frequency	: 16	10	7	5

(b) Draw Ogive curves (both less than and more than types) from the frequency distribution given in Question No. 2 (a).

UNIT—II

3. (a) What are the characteristics of a good average? Compare the mean, median and mode in the light of these characteristics.
- (b) Can the values of mean, median and mode be same? If yes, state the situation.
- (c) Calculate the median and mode of the following :

Annual Sales (₹ '000) Frequency

Less than 10	4
Less than 20	20
Less than 30	35
Less than 40	55
Less than 50	62
Less than 60	67



3) Is it possible to calculate the arithmetic mean? If possible, calculate it. $4+2+4=10$

Discuss the validity of the following statement :

"An average, when published should be accompanied by a measure of dispersion, for significant interpretation."

Calculate the quartile deviation and its coefficient from the following data :

Class Interval	Frequency
10-15	4
15-20	12
20-25	16
25-30	22
30-40	10
40-50	8
50-60	6
60-70	4

$$4+6=10$$

UNIT—III



5. (a) State with reasons, whether the following statements are true or false :

(i) Coefficient of correlation between two variables must be in the same units as the original data.

(4)
 (iii) The correlation coefficient between rainfall and wheat yield per hectare was found to be 0.8. Hence more rainfall means more agricultural production.

(b) Find Karl Pearson's coefficient of correlation between age and playing habit of the people from the following data :

Age group (years)	No. of people	No. of players
15 and less than 20	200	150
20 and less than 25	270	162
25 and less than 30	340	170
30 and less than 35	360	180
35 and less than 40	400	180
40 and less than 45	300	120

(2+2)+6=

6. (a) Explain the difference between Karl Pearson's (product moment) correlation coefficient and rank correlation coefficient.

(b) State the significance of rank correlation coefficient in economics.

(5)
rank of the ten students in two
projects A and B are as follows :

1	3	5	8	4	7	10	2	1	6	9
2	6	4	9	8	1	2	3	10	5	7

Calculate coefficient of rank correlation
and interpret the result.

$$3+2+5=10$$

UNIT—IV



Given two lines of regression, explain
how you will find—

- the mean values (\bar{x}, \bar{y}) ;
- the regression coefficients b_{yx} and b_{xy} ;
- the correlation coefficient r_{xy} ;
- the ratio of the s.d's σ_x / σ_y .

You are supplied with the following
data :

$$4x - 5y + 33 = 0, \quad 20x - 9y - 107 = 0,$$

variance $x = 9$

Calculate—

- the mean values of x and y ;
- standard deviation of y ;
- coefficient of correlation between x
and y .

$$4+6=10$$

Over

(6)

(a) If $a_1x + b_1y + c_1 = 0$

and $a_2x + b_2y + c_2 = 0$

are the equations of the line of regression of y on x and x on y respectively, then prove that

$$a_1b_2 \leq a_2b_1$$

(b) The equations of two regression lines between two variables are expressed as

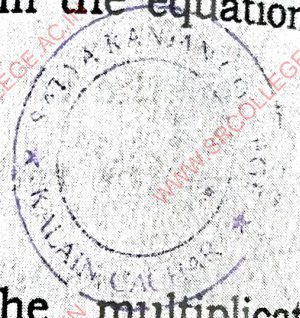
$$2x - 3y = 0 \text{ and } 4y - 5x - 8 = 0$$

(i) Identify regression equation of y on x and x on y .

(ii) Find \bar{x} and \bar{y} and correlation coefficient (r) from the equations.

4+6=10

UNIT—V



9. (a) State and prove the multiplication theorem of probability.

(b) A husband and wife appear in an interview for two vacancies in the same post. The probability of husband's selection is $\frac{1}{7}$ and that of wife's selection is $\frac{1}{5}$. What is the probability that—

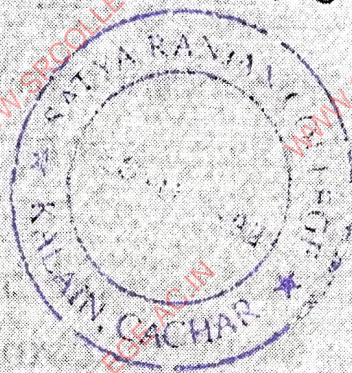
(i) both of them will be selected;

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By one of them will be selected;
none of them will be selected? $4+6=10$

state and prove Bayes's theorem.

A restaurant serves two special dishes, A and B to its consumers consisting of 60% men and 40% women. 80% of men order dish A and rest B. 70% of women order B and the rest A. In what ratio of A to B should the restaurant prepare the two dishes?

$4+6=10$



(8) GROUP—B

Course No. : ECOH-502 (Science)
(For Science Students)

(Elements of Econometrics—I)

Answer five questions, taking one
from each Unit

UNIT—I

1. Make a comparison between econometrics and statistics. Why is the study of econometrics important in modern times? Discuss logically.

6+4=

2. Define and interpret an econometric model. Make a comparison between econometrics and mathematical economics.

4+6=

UNIT—II

3. Write short notes on the following :

2×5=

(a) Random variable

(b) Random experiment

(c) Mathematical expectation

(d) Distribution function

(e) Variance of a random variable



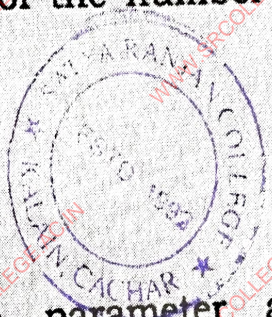
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A coin is tossed three times. Let, X be the number of heads obtained in n tosses of the coin. Find the following things :

$2 \times 5 = 10$

- (a) The probability of obtaining no head
- (b) The probability of obtaining at least two heads
- (c) The probability of obtaining atmost two heads
- (d) Mathematical expectation of the number of heads
- (e) Distribution function of the number of heads

UNIT—III



- 5. (a) Distinguish between parameter and statistics. 4
- (b) Define sampling distribution of a statistics. Why population mean does not have a sampling distribution? 2+1=3
- (c) Add a note on the utility of standard error in econometric analysis. 3

(Turn Over)

6. (a) Define probability mass function. Calculate the values of expectation and variance :

x	0	1	2	3	4
$P(x)$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{5}$

- (b) Define probability density function. The distribution function of a continuous random variable X is given as

$$F(X) = e^{-3x} + x \cdot \log x$$

Find the probability density function of X .

UNIT—IV



7. Write short notes on the following :

(a) Maximum likelihood method

(b) Standard OLS assumptions

8. Show that OLS estimators are Best Linear Unbiased Estimators (BLUE) in the context of a two-variable linear regression model.

UNIT—V

Define autocorrelation. How can one detect the problem of autocorrelation in a multiple regression model? State the remedial measures of autocorrelation.

2+4+4=10

Distinguish between perfect multicollinearity and less than perfect multicollinearity. How can one detect the problem of multicollinearity in a multiple regression model? State the remedial measures of multicollinearity.

2+4+4=10

