

Day: Friday  
Date: 03/05/2019

**S-2019-1958**

Time: 02.00 PM TO 05.00 PM  
Max. Marks: 100

**N.B.:**

- 1) Answer **ANY FOUR** questions from **Section I**. Each question carries **15** Marks.
- 2) Answer **ANY TWO** questions from **Section II**. Each question carries **20** Marks.
- 3) Answers should be written in **SAME** answer book.
- 4) Use of non-programmable calculator is **ALLOWED**.

**SECTION - I**

Q.1) Answer the following: (15 Marks X 1 = 15 Marks)

What is Correlation? Explain its types and applications in brief.

Q.2) Answer the following: (15 Marks X 1 = 15 Marks)

If the two lines of regression are  $4x + 5y = 30$  and  $20x + 9y - 107 = 0$

- (i) Find mean values of  $x$  and  $y$
- (ii) Find correlation coefficient ( $r$ )
- (iii) Find  $\sigma_y$  when  $\sigma_x = 4$

Q.3) Answer the following: (15 Marks X 1 = 15 Marks)

What is coefficient of association? How does it differ from correlation?

Q.4) Answer the following: (15 Marks X 1 = 15 Marks)

Two fair dice are thrown. Find the probability that

- (i) the total score is 10
- (ii) sum of scores is a prime number
- (iii) the sum of scores is not more than 8

Q.5) Answer the following: Attempt ANY ONE (15 Marks X 1 = 15 Marks)

- a) 10 unbiased coins are tossed simultaneously, Find the probability that there will be
  - (i) Exactly 5 heads
  - (ii) At least 8 heads
  - (iii) Not more than 3 heads
- b) What is meant by Statistical Decision Theory? How is it different from other methods used in decision making?

Q.6) Write short notes on the following: Attempt ANY THREE (5 Marks X 3 = 15 Marks)

- a) Pearson's Correlation Coefficient
- b) Properties of regression
- c) Yule's coefficient of association
- d) Probability
- e) Binomial distribution

## SECTION -II

Q.7) Answer the following: Attempt ANY ONE (20 Marks X 1 = 20 Marks)

- a) Two ladies were asked to rank 10 different types of beauty soaps. The ranks given by them were as below:

Beauty soap	A	B	C	D	E	F	G	H	I	J
Sheetal	3	1	7	4	6	5	2	9	10	8
Ananya	1	3	2	5	7	6	4	10	8	9

Calculate Spearman's rank correlation coefficient.

- b) From the following data regarding Wages and Cost of living

Wages in '000 Rs	100	101	103	102	100	99	97	98	96	95
Cost of living in '000 Rs	98	99	99	97	95	92	95	94	90	91

Find:(i) Correlation Coefficient between wages and cost of living.

(ii) Two regression equations.

(iii) Estimate the wages when cost of living is 80,000 Rs.

(iv) Estimate the cost of living when wages are 65,000 Rs.

Q.8) Answer the following: Attempt ANY ONE (20 Marks X 1 = 20 Marks)

- a) Calculate Yule's Coefficient of Association between eye colour of husband and eye colour of wives from the data given below. Comment on its value.

Husband with light eyes and wives with light eyes = 309

Husband with light eyes and wives with not light eyes = 214

Husband with not light eyes and wives with light eyes = 132

Husband with not light eyes and wives with not light eyes = 119

- b) Three machines A, B and C produce 70%, 20%, and 10% of the total number of items of a factory. The percentage of defective output of these machines are 1%, 2%, and 3% respectively.

An item is selected at random and is found defective. Find the probability that the items were produced by (i) machine B

(ii) machine C

Q.9) Answer the following: Attempt ANY ONE (20 Marks X 1 = 20 Marks)

- a) In an aptitude test administered to 1000 children the score is supposed to follow normal distribution with average score 42 and standard deviation 24

Find(i) The number of children exceeding the score 60

(ii) The number of children whose score is between 40 and 50

(iii) The number of children whose score is below 58

- b) Using the various criteria for decision making find the optimal strategy for the marketing manager of an automobile company. The conditional pay-offs in crores of rupees for the two models of a car for the various likely sales figures are as follows.

Model	Sales (Units)		
	1 Lakh	2 Lakh	3 Lakh
X	30	10	10
Y	55	20	3

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