

CARMEL COLLEGE OF ARTS , SCIENCE AND COMMERCE FOR WOMEN
SEMESTER END EXAMINATION , APRIL – 2019

Semester : IV of B.Com

Subject and Sub Code : BUSINESS STATISTICS-II (GE 5)

Total Marks : 80

Date : 27/04/2019

Duration : 2 hours

- Instructions : 1. . All questions are compulsory , however internal choice is available.*
2. Figures to the right indicate marks allotted.
3. Non programmable calculators are allowed .

Q1. Answer any four of the following :

(4 x 4 = 16)

- a) Draw the scatter diagram for the data and state the nature of correlation between the variables.

x	4	8	7	6	1	3	5	2
y	30	10	20	60	80	40	20	70

- b) Define Linear Regression and Regression Analysis.
c) Using the Spearman's formula , find the rank correlation coefficient if $n = 5$, $\sum d^2 = 8$.
d) Define Interpolation and Extrapolation .
e) State Newton's forward and backward difference formula for equal intervals.
f) Describe the properties of coefficient of correlation.

Q2. Answer any four of the following :

(4 x 4 = 16)

- a) Describe Systematic Sampling .
b) The average number of incoming telephone calls at a switch board per minute is 2. Find the probability that during a given minute , 2 or more calls are received . (Given $e^{-2} = 0.135$).
c) Two cards are drawn from a pack of cards . Find the probability that one is heart and other is spade.
d) Define testing of hypothesis and explain its types .
e) State and prove addition theorem on probability.
f) For a Binomial Distribution , mean = 5 and s.d. = 2 . Find n and p .

Q3. a) Find Karl Pearson's Coefficient of Correlation for the following data .

(6)

x	1	2	3	5	4	3
y	2	4	5	5	3	1

- b) Estimate the annual premium payable at the age of 28 years from the following data using suitable interpolation formula :

(6)

Age (Years)	20	25	30	35
Annual (Premium Rs.)	360	390	430	470

OR

Q3. x) For the following data find (i) the coefficient of regression (ii) coefficient of correlation (6)

X	4	6	8	10	12
y	7	3	1	5	9

y) Find out the missing value in the following data using interpolation : (6)

x	1931	1941	1951	1961	1971
y	17	25	30	-	100

Q4. a) Find the rank correlation coefficient of the following . (6)

R_1	1	3	4	5	2	6	8	7
R_2	2	3	6	8	1	7	5	4

b) Using an appropriate formula for interpolation , estimate the number of students who obtained less than 45 marks from the following data : (6)

Marks	30-40	40-50	50-60	60-70	70-80
No. of students	31	42	51	35	31

OR

Q4. x) For the following data ,

x	2	4	6
y	6	2	1

find i) the coefficient of regression
 ii) the equation of both the lines of regression and hence find y, when $x = 1$ and find x when $y = 2$. (6)

y) By using Lagrange's method , estimate the number of persons whose income is Rs. 1900 and more but less than Rs. 2500 from the following table : (6)

Income in ('00) Rs	0-9	9-19	19-28	28-37	37-46
No. of persons	50	70	203	406	304

- Q5. a)** Two perfect cubic dice are thrown . Find the probability that the sum of the numbers on their upper faces is at least 9. (6)
- b)** A sample of size 100 was drawn and the sample mean was found to be 32. If the standard deviation of the sample is 5 , test using 5% level of significance whether the sample is drawn from a population with mean 35. (6)

OR

- Q5. x)** Two dice are rolled. Find the probability that the sum of the numbers on the two faces is either divisible by 3 or divisible by 4. (6)
- y)** The mean of a random sample of 300 objects is 51.3 and the mean of another sample of 500 objects is 40. Can we conclude at 5% level of significance, that both the samples are drawn from the same population with standard deviation 10? (6)

- Q6. a)** The probability that a student is not a swimmer is $\frac{1}{5}$. Out of 5 students considered , find the probability that atleast 4 are swimmers. (6)
- b)** A box contains 7 balls of the same shape and size .A few balls in the box are black and the rest are all white. If m is the number of black balls in the box, then in the usual notations , H_0 is $m = 4$ and H_1 is $m = 2$. Also the null hypothesis is tested as follows :
When 3 balls are drawn at random from the box , if atmost one ball is black , then H_0 is to be accepted else H_0 is to be rejected . Find the probabilities of Type I and Type II errors.
Also state power of test.

OR

- Q6. x)** For the following probability distribution , find $P(X > 4)$, $P(X \leq 3)$. (6)

X	1	2	3	4	5	6
P(X)	$\frac{2}{10}$	$\frac{3}{10}$	$\frac{1}{10}$	$\frac{1}{10}$	$\frac{2}{10}$	$\frac{1}{10}$

- y)** A random sample of size 400 has sample proportion 0.75 . can we say that , it is drawn from a population with Proportion $P = 0.8$ at 5% level of significance ? (6)
