

**CARMEL COLLEGE OF ARTS, SCIENCE AND COMMERCE FOR WOMEN,  
NUVEM-GOA**

**B.COM. CBCS Semester IV Examination, July, 2021**

**Semester: IV OF B.COM**                      **Course name & Code: Business Statistics II (CAG102)**  
**Total marks: 40**                      **Date: 15-07-2021**                      **Duration: 2 Hrs**                      **Total No. of pages: 2**

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**Instructions:**

1. All questions are compulsory, however internal choice is available.
2. Figures to the right indicate maximum marks allotted to the question.
3. Student shall write down the answers and should **sign each and every page with date** and then upload the scanned copy/photograph of the answer sheet in PDF format. A student must upload their answer scripts by 1:00 pm.
4. PDF should be titled as : **Name of the student\_Seat Number\_paper code.**

Q.1. Attempt **any five** of the following: **[10]**

- a) Given the equation of the regression lines for certain bivariate data as  
 $2x - y = 15$  and  $4y = 3x + 25$ , find the mean value of  $x$  and  $y$ .
- b) Compute the coefficient of rank correlation between marks in mathematics ( $X$ ) and marks in statistics ( $Y$ ) for the data given below.  
Marks in mathematics: 88    56    50    45    62    60  
Marks in statistics : 92    76    75    63    50    65
- c) The probability that a 50 years old man will be alive at 60 is 0.83 and the probability that a 45-years old woman will be alive at 55 is 0.87. What is the probability that a man who is 50 or his wife who is 45 will be alive 10 years hence?
- d) A six faced die is so biased that it is twice as likely to show an even number as an odd number when thrown. It is thrown twice. What is the probability that the sum of the two numbers thrown is even?
- e) What is the probability that the four S's come consecutively in the word MISSISSIPPI?
- f) A function  $f(x)$  takes the values as given in the following table:  

$x$	:	1	3	4
$f(x)$	:	4	12	19

Find  $f(x)$  when  $x = 2$
- g) A random sample of 200 consumer accounts at a large brokerage firm is selected for the purpose of estimating the mean number of transactions per year for each consumer. The sample mean is 43 and standard deviation is 12. Determine 99% confidence interval for mean number of customer accounts of the firm.
- h) Explain Type I and Type II errors with reference to testing of hypothesis.  
In order to test whether a coin is fair or not, it is tossed five times. The null hypothesis of fairness is rejected if and only if the number of heads is zero or five. Find the probability of type I error of the test.

Q.2. Attempt **any six** of the following:

[30]

- a) Given following are the two regression equations as:

$$5x - 6y + 90 = 0 \text{ and } 15x - 8y - 180 = 0.$$

Find the coefficient of correlation between  $x$  and  $y$ .

- b) A hospital switchboard receives an average of 4 emergency calls in a 10-minute interval. What is the probability that (i) there are at most 2 emergency calls in a 10-minute interval, (ii) there are exactly 3 emergency calls in a 10-minute interval?

(Given value of  $e^{-0.4} = 0.6703$ ,  $e^4 = 54.5981$ ,  $e^{-4} = 0.0183$ )

- c) A computer on calculating the correlation coefficient between two variables  $x$  and  $y$  for 25 pairs of observation obtained the following results:  $\sum x = 125$ ,  $\sum y = 100$ ,  $\sum x^2 = 650$ ,  $\sum y^2 = 480$  and  $\sum xy = 516$ , it was however noticed that the pairs (6, 14) and (8, 6) were wrongly taken as (8, 14) and (6, 8). Find the correct correlation coefficient.

- d) The data relating to the import price ( $y$ ) and import quantity ( $x$ ) in respect of a given commodity are as under:

Year	1986	1987	1988	1989	1990	1991	1992	1993
Import Price ( $y$ )	3	6	5	4	3	5	8	7
Quantity imported ( $x$ )	5	4	5	7	10	9	8	9

Compute the Karl Pearson's correlation coefficient.

- e) An advertising company claims that 40% of the people who saw an advertisement put out on the television by the company remembered the name of the product 24 hours after they had seen the show. In a sample survey conducted 24 hours after the show, 152 out of 400 persons remembered the name of the product advertised. Test if the claim of the company can be accepted at a level of significance one per cent.
- f) A carefully designed "Sample Survey" is said to be better than a poorly planned and executed "Census". Bring out the merits of sample methods of enquiry and explain any two methods to obtain representative data in a sample.
- g) A random sample of boots worn by 40 combat soldiers in a desert region showed an average life of 1.08 years with a standard deviation of 0.05 years. Under standard conditions, the boots are known to have an average life of 1.28 years. Is there a reason to assert at a level of significance 0.05 that use in the desert causes the mean life of such boots to decrease?
- h) State Newton's backward interpolation formula with assumptions.  
Estimate by Newton's method of interpolation, the expectation of life at age 34 from the following data.

Age(years)	:	10	15	20	25	30	35
Expectation of life (years)	:	35.3	32.4	29.2	26.1	23.2	20.5

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