SYBCOM Semester End Assessment (Regular/Repeat)
April, 2023

Course Title: BUSINESS STATISTICS - II

Course Code: UCAG102 **Category: GE** **Semester: IV**

Duration: 2 hrs **Max Marks: 80**

Instructions:

1. The question paper contains 5 main questions spread across 3 pages.
2. All the questions are compulsory however internal choice is available.
3. Use of calculator is allowed.
4. Figures to the right indicate marks allotted.
5. You may answer randomly but every main question attempted should be answered serially.

Q1) a. State and explain different types of correlation. (3)

b. Draw a scatter diagram to represent the following data. (6)

x	15	18	30	27	25	23
y	9	3	12	16	17	10

c. Calculate the correlation coefficient for the data given below. (7)

x	33	60	43	79	25	51
y	52	63	45	36	72	65

OR

QI) p. What is a scatter diagram? Explain. (3)

q. Calculate rank coefficient of correlation for the following data. (6)

Rank X	7	6	2	3	1	4	5
Rank Y	4	5	1	2	3	6	7

r. A random sample of 8 school students is selected and their marks in two subjects are found. Find Spearman's rank coefficient of correlation. (7)

Marks in Eng	52	34	47	65	52	34	52	65
Marks in Geog.	65	59	65	68	60	68	57	68

Q2) a. Find b_{xy}, if $b_{yx} = 0.435$ and $r = 0.891$. (3)

b. For the following data, find regression equation x on y and hence find x when y = 10.

$$n = 12, \quad \sum x = 15, \quad \sum y = 20, \quad \sum (x - \bar{x})^2 = 360$$
$$\sum (y - \bar{y})^2 = 250, \quad \sum (x - \bar{x})(y - \bar{y}) = 225$$ (6)

c. Sachin has won 20 out of 30 games of tennis with Sehwag. In a new series of 6 games, what is the probability that Sachin will win only 4 games? (7)

OR

QII) p. If r = 0.52, cov(x, y) = 7.8, var (x) = 16, then find σ_y. (3)

q. If $\bar{x} = 20, \quad \bar{y} = 15, \quad \sigma_x = 4, \quad \sigma_y = 3, \quad r = 0.7$, find regression equation of y on x and estimate y when x = 24. (6)

r. A manufacturing unit manufactures scooters. It has been observed that the probability of getting defective piece is 0.2. If a consignment of 10 scooters is considered, using Poisson distribution, calculate the probability of finding:
(i) no defective scooter (ii) at least one defective scooter. (7)
(Given: $e^{-0.02} = 0.9802$, $e^{-0.2} = 0.8187$, $e^{-2} = 0.1353$)

Q3) a. Define event. State different types of events. (3)
b. Find the probability of getting sum of 9 or more when two dice are thrown. (6)
c. The marks scored by 1000 students in a certain test are normally distributed with mean marks 42 and the standard deviation 24. Find:
(i) The number of students exceeding marks 60.
(ii) The number of students with scores lying between 18 and 90.
(Given: area between t = 0 & t = 0.75 is 0.2734, area between t = 0 & t = 1 is 0.3413, area between t = 0 & t = 2 is 0.4772) (7)

OR

QIII) p. State the theorems on probability. (3)
q. A player tosses a coin thrice. He wins ₹ 10 if 3 heads appears, ₹ 5 if 2 heads appears, ₹ 1 if 1 head appears and loses ₹ 15 if 3 tails appears. Find his expected gain. (6)
r. The income distribution of a group of 1,00,000 persons was found to be normally distributed with mean ₹ 750 and standard deviation ₹ 50. What percentage of this group has income: (i) exceeding ₹ 668 (ii) exceeding ₹ 832
(Given: area between t = 0 & t = 1.64 is 0.4382) (7)

Q4) a. If a coin is tossed thrice, what is he probability of getting at least one head? (3)
b. The height of ten students selected at random, had a mean height of 158 cms and deviation of 6 cms. Assuming L.O.S of 5%, test the hypothesis that the population are on the average of height less than 162 cms. (6)
c. In a random sample of 400 persons from a city, 120 are females. Can it be said that the males and females are in the ratio 5:3 in the population? (7)

OR

QIV) p. What is the probability of drawing either a king or an ace from pack of cards? (3)
q. The manufacturer claims that at least 95% of the items produced by its firm are good. An examination of 200 pieces of items revealed that18 were defective. Test the claim at 5% LOS. (6)
r. In a random sample of 400 persons, 80 are smokers. Find 95% confidence interval for the percentage smokers in the sample. (7)

Q5) a. For a binomial distribution having n = 100, p = 0.2, find mean and S.D. (3)
b. Using Newton's forward interpolation formula, evaluate y at x = 5. (6)

x	4	6	8	10
y	1	3	8	10

c. Using Lagrange's interpolation formula, find the value of y corresponding to x = 10 from the following table. **(7)**

x	5	6	9	11
y	12	13	14	16

OR

QV) p. State the properties of the normal curve. **(3)**

q. Form the forward difference table for the following data: **(6)**

x	0	1	2	3	4	5
y	8	11	9	15	6	16

r.Find the missing value from the following data: **(7)**

Marks obtained	10	20	30	40	50
No. of students	5	23	?	45	75

**********All The Best**********