PARUL UNIVERSITY
FACULTY OF MANAGEMENT
BBA Summer 2022-23 Examination

Semester: 3   **Date: 28/03/2023**
Subject Code: 06191206   **Time: 2.00pm to 4.30pm**
Subject Name: Business Statistics-I   **Total Marks: 60**

Instructions:
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 A   Multiple Choice Of Questions :   05
    (1) If coefficient of co-relation $r = 0$ then the two variables are _____
      (a) Linearly Independent   (c) Linearly Dependent
      (b) Positive relation   (d) Negative relation
    (2) The regression coefficient are independent of change of _____
      (a) Scale   (c) origin and Scale
      (b) Origin   (d) None of above
    (3) When a dice is thrown, A and B are the events of getting odd numbers and even numbers respectively then $p(A \cap B) = $ _____
      (a) 1   (c) 0
      (b) 0. 5   (d) 0.8
    (4) If $E(x) = 5$ and $E(x^2) = 29$ then *Variance* $(x) = $ _____
      (a) 5   (c) 25
      (b) 29   (d) 4
    (5) The parameters of binomial distribution is _____
      (a) n,p   (c) n,q
      (b) p,q   (d) np,npq

Q.1 B   Define the following : (Each of 1 mark)   05
    (1) Regression Analysis
    (2) Random Experiment
    (3) Independent Event
    (4) Mutually Exhaustive Event
    (5) Probability mass function

Q.1 C   Direct Questions : (Each of 1 Mark)   05
    (1) What do you mean by positive correlation?
    (2) Write construction of R chart
    (3) If A and B are two independent event, $P(A) = \frac{1}{2}$ and $P(B) = \frac{1}{5}$ find $P(A \cap B)$
    (4) Write a probability mass function of Poisson distribution.
    (5) The mean of Poisson distribution is 3. Find its standard deviation .

Q.2 A   Answer the following questions.
    (1) The following data are obtained for two variables x and y: 04
$$n = 30 , \sum x = 120, \sum y = 90, \sum x^2 = 600, \sum y^2 = 250, \sum xy = 356$$
However, Later on it was observed that two pairs were wrongly taken as (8,10) and (12,7) instead of (8,12) and (10,8). Find the correct value of correlation coefficient.
    (2) There are 6 black balls and some white balls in a box. The probability of drawing 2 black balls from it is $\frac{1}{3}$. Find the number of white balls in the box.   03

Q.2 B   **Answer the following questions.**

(1) The following information is obtained from result of an example.   **04**

	Marks in Mathematics (x)	Marks in Statistics (y)
Average	39.5	47.5
Standard Deviation	10.8	16.8
Correlation coefficient between x and y =0.42		

Obtain the two regression lines.

(2) If $p(A) = \dfrac{1}{3}, p(B') = \dfrac{1}{4}, p(A \cap B) = \dfrac{1}{6}$, find $p(A \cup B), p(A' \cap B'), p(A'/B')$ **04**

Q.3 A   **Answer the following questions.**

(1) The probability that a bomb dropped from a plane will hit a target is $\dfrac{2}{5}$. Two bombs are   **04**

enough to destroy s bridge. If 4 bombs are dropped on a bridge find the probabilities that
- (i)   The bridge will be destroyed
- (ii)   The bridge will be partially destroyed
- (iii)   The bridge will be saved

(2) There are 10 electric bulbs in a box in which 3 are defective bulbs. If 3 bulbs are selected at   **03** random from the box, find the expected number of defective bulbs.

Q.3 B   **Answer the following questions.**

(1) Between the hours of 2 and 4 p.m. the average number of phone calls per minute coming   **04** into the switch board of a company is 2.5. Find the probabilities that during one particular minute there will be,
- (i)   No phone call at all
- (ii)   Exactly 4 calls
- (iii)   At most 2 calls

$$\left(e^{-2.5} = 0.0821\right)$$

(2) Two cubical dice are thrown simultaneous. Find the probability of getting :   **04**
- (i)   Total '9'
- (ii)   Total at least '9'

Q.4   **Attempt any two questions. (Each of 7.5 mark)**   **15**

(1) What is correlation? Find Correlation Coefficient from the following data :

X	300	350	400	450	500	550	600	650	700
Y	800	900	1000	1100	1200	1300	1400	1500	1600

(2) Find the equations of regression lines and the correlation coefficient from the following data:

X	28	41	40	38	35	33	46	32	36	33
Y	30	34	31	34	30	26	28	31	26	31

(3) The following table gives the information regarding life hours of 5 fluorescent of 10 different samples. Draw $\overline{X}$ and R charts and state your conclusions.

Sample	1	2	3	4	5	6	7	8	9	10
$\overline{X}$	3290	3180	3350	3370	3280	3240	3260	3410	3310	3510
R	360	210	50	100	50	400	500	200	300	600

$$\left[n = 5, A_2 = 0.58, D_3 = 0, D_4 = 2.11 \right]$$

(4) State Baye's theorem. It is known that 40% of the boys and 20% of girls are failed in a "Business Statistics" paper of second year BBA class with equal number of boys and girls. A student is selected at random and is found to be failed. What is the probability that selected student is (i) Boy? (ii) Girl?