

B.B.A. Semester - 3 (CBCS) Examination**Oct/Nov. -2018****BUSINESS STATISTICS (ELECTIVE 1)****Time: 2:30 Hours****Marks: 70****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate marks.

- Que-1 (a) Write additional theory for two events and prove it. (05)
- (b) If $P(A) = 1/3$, $P(B) = 3/4$ and $P(A \cup B) = 11/12$ find $P(A/B)$, $P(B/A)$, $P(A \cap B')$ and $P(A' \cap B')$ (05)
- (c) A mobile company launches two types of plans A and B to its customers. 60% are male's customers and 40% are female customers. 80% of male preferred for plan A and rest for plan B. 70% of females preferred for plan B and rest for plan A, in what ratio of plan A and B should be preferred by customers. (04)

OR

- Que-1 (a) Write multiplication theory for two events and prove it.
- (b) If $P(A) = 2P(B) = P(A/B) = 0.4$ find (i) $P(A \cap B)$ (ii) $P(A \cap B')$ (iii) $P(A \cup B)$ (iv) $P(A' \cap B')$.
- (c) There are 6 red and 8 white balls in a bag and 5 red and 4 white balls in another bag. One bag is selected at random and 2 balls are drawn from it, what is the probability that both are red.
- Que-2 (a) In usual notation prove that (i) $E(cX + d) = c E(X) + d$ (ii) $V(cX + d) = c^2 V(X)$. (05)
- (b) The probability distribution of the demand X for a certain commodity is given below. (05)

X	8	12	16	20	24
P(x)	1/8	1/6	1/8	1/4	1/12

- (i) Find the expected demand.
- (ii) If revenue function $R = 100X$ then find the expected revenue.
- (iii) If cost function $C = 100 + 5X$ then find expected cost.
- (iv) Find expected profit.
- (c) Probability distribution of random variable X is given below. (04)

X	3	4	5	6	7	8
P (x)	0.02	0.18	4p	0.16	P	0.04

Find (i) value of p (ii) Mean of X

OR

- Que-2 (a) Write area properties of normal distribution. (05)
- (b) The average life of a electronic toy is 400 hours and its s. d. is 50 hours. Assuming distribution to be normal. (05)
- Find (i) percentage of toy having life more than 350 hours.
- (ii) The percentage of toys with life time between 300 and 500 hours.
- (c) For normal distribution with mean 50 and s. d. 15 find Q1 and Q3 Quartile deviation and mean deviation. (04)
- Que-3 (a) Write properties and uses of binomial distribution. (05)
- (b) A particular flight reaches the destination in time in 75% of the times. a person travels 5 times in that flight. Find the probability that he will reach the destination in time, for all the 5 times. (05)
- (c) For five independent trials of binomial distribution probability of 2 and 3 success are respectively 0.2048 and 0.0512 then find value of p. (04)

OR

- Que-3 (a) Derive probability function of Poisson distribution in case of binomial distribution. (05)
- (b) The probability that a pen is found defective is 1/100. Each box contains 50 pens. Using (05)

Poisson distribution find % of number of boxes having 0, 1, 2 pens are defective.

- (c) If x is a Poisson variate and $P(X = 0) = 0.05$ find value of $P(x > 2)$ (04)

- Que-4 (a) Write properties of correlation coefficient. (05)

- (b) Find value of 'r' from the following data. (05)

X	240	230	220	210	200	190	180	170	160
Y	4.2	4.9	5.0	6.0	6.2	6.7	5.5	6.1	5.9

- (c) Calculate correlation coefficient from the data given below. (04)

Particular	X	Y
Numbers of observations	15	15
Averages	25	18
The sum of square of deviations from means	136	138
The sum of product of deviations from means	112	

OR

- Que-4 (a) Define (i) probable error (ii) coefficient of determination (05)

- (b) Find no of pairs from the following data: $r=0.5$; $\sum xy = 120$ $\sum x^2 = 90$; $S_y = 8$ (05)

- (c) Find coefficient of Rank correlation. (04)

X	28	27	26	35	39	42	39	37	32	22
Y	40	42	38	49	40	50	38	44	45	36

- Que-5 (a) Explain the meaning of Regression. How does it differ from correlation (05)

- (b) The coefficient of correlation between two variables x and y is 0.6. If their means are 16 and 20 and variances are 36 and 64 respectively. Find (i) obtain two regression equations. (ii) estimate the value of y when $x = 12$, (iii) estimate the value of x when $y = 16.8$ (05)

- (c) Obtain regression line y on x from the following data. (04)

X	3	2	1	6	4	2	5	7
Y	5	13	12	-1	2	20	0	-3

OR

- Que-5 (a) The following table gives the distribution of total cultivate area (X) and the area under cultivation of wheat (Y) in a district of 70 villages. (14)

Area under Wheat (y)	Total cultivate area (x)				
	0-50	50-100	100-150	150-200	200-250
0-20	12	16	-	-	-
20-40	2	18	4	2	1
40-60	-	4	7	3	-
60-80	-	1	-	2	2
80-100	-	-	1	2	3

Obtain the two lines of regression and the correlation coefficient.
