

PRABODHAN EDUCATION SOCIETY'S
 VIDYA PRABODHINI COLLEGE OF COMMERCE, EDUCATION,
 COMPUTER AND MANAGEMENT, VIDYANAGAR, PARVARI, GOA.

S.Y.B.COM SEMESTER END EXAMINATION APRIL 2018 (REGULAR/REPEAT)

SUB: STATISTICAL TECHNIQUES – II

SEMESTER: IV CLASS: S.Y. B.COM DURATION: 2HRS MAX. MARKS: 80

- INSTRUCTIONS: 1. All questions are compulsory however internal choice is available.
 2. Use of calculator is allowed.
 3. Figures to the right indicate marks allotted.
 4. There are 5 main questions each carrying 16 marks.
 5. You may answer randomly but every main question attempted should be answered serially.

Q.1) Attempt the following:

a) Define correlation and state different types of correlation. (3)

b) Calculate coefficient of correlation for the data given below? (6)

X	21	25	32	18	22	30
Y	07	11	09	07	10	15

c) Find the regression equation X on Y. (7)

X	-1	-2	0	1	2
Y	-3	-2	0	1	2

OR

Q.1) Attempt the following:

x) If $r = 0.671$ and $b_{xy} = 0.876$, find the value of other regression coefficient. (3)

y) Calculate Spearman's rank correlation for the following: (6)

Marks 1	30	80	70	60	50	90
Marks 2	70	61	87	45	40	57

z) From the following data, write down the regression equation Y on X. (7)

X	2	4	6	8	10	12
Y	4	2	5	10	4	11

Q.2) Attempt the following:

a) Write down the formulae to calculate coefficient of correlation and regression coefficients for any given data of X and Y. (3)

b) From the information given below find both regression lines.
 $r = 0.5, \sigma_x = 4, \sigma_y = 3, \bar{y} = 20, \bar{x} = 25$ (6)

c) One card is drawn at random from a well shuffled pack of 52 cards. Find the probability that it is
 i) Diamond or an ace
 ii) Red card or a queen. (7)

OR

Q.II) Attempt the following:

- x) Draw a rough graph for perfect positive correlation and strong negative correlation (3)
- y) Find Y, when X = 1.5 for the following data. (6)

X:	5	7	8	9	11
Y:	4	6	5	2	3

- z) An unbiased die is rolled 10 times. What is the probability that the uppermost face is more than 4 exactly a) 7 times, b) more than 8 times. (7)

Q.3) Attempt the following:

- a) Define i) Random Experiments
ii) Simple and Compound Events
iii) Mutually Exclusive Events (3)
- b) Two unbiased 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)
- c) The marks obtained by 120 SYBCOM students in the subject of statistics are normally distributed with mean marks 67 and standard deviation of 6 marks. Find the number of students getting marks
(i) less than 55 (ii) between 70 to 79
(Given: area between $t = 0$ & $t = 2$ is 0.4772, area between $t = 0$ & $t = 0.5$ is 0.1915) (7)

OR

Q.III) Attempt the following:

- x) A coin is tossed twice. If the first toss has resulted in heads, find the probability that the second toss will also result in heads. (3)
- y) If the probability that any of the 5 telephone lines are busy at any instant is 0.1., find the probability that all the lines are busy. Also find the probability that not more than three lines are busy. (6)
- z) For a Poisson distribution with $m = 0.7$, find $P(2)$ and $P(x \leq 2)$, given that $e^{-0.7} = 0.497$. (7)

Q.4) Attempt the following:

- a) Explain the term Sample Enumeration. (3)
- b) On an average, Mr. A can solve 40% of the problems. What is the probability of Mr. A solving:
(i) No problems out of 6 (ii) Exactly 4 problems out of 6. (6)
- c) A D.T.P. operator claims that she can type a regular text at an average speed of 100 words per minute. In 36 trials, her average speed was 95 words per minute with a deviation of 10 words. Is her claim justified? Use 1% LOS. (7)

OR

Q.IV) Attempt the following:

- x) Write a short note on systematic random sampling. (3)
- y) The incomes of a group of 10000 persons were normally distributed with mean Rs. 6000 and standard deviation 100. Find the number of persons having income between 5800 and 6300.
(Given: area between $t = 0$ & $t = 2$ is 0.4772, and area between $t = 0$ and $t = 3$ is 0.4987) (6)
- z) A sample of size 100 was drawn and the sample mean was found to be 32 and standard deviation of 5, test using 5% LOS, whether the sample is drawn from a population with mean 35. (7)

Q.5) Attempt the following:

a) Write short note on point estimate and interval estimate. (3)

b) Construct X-chart for the following data and comment. (Given $A_2 = 0.68$) (6)

Sample No.	1	2	3	4	5	6	7	8
Mean X:	2.4	3.2	2.7	2.9	3.3	3.0	2.5	3.1
Sample range:	0.3	0.6	1.0	0.2	1.2	0.8	1.0	1.5

c) For the following data construct R chart (Given: $D_3 = 0$ $D_4 = 2.115$). (7)

Sample no.	1	2	3	4	5	6	7	8
Range	18	21	20	21	22	24	25	23

OR

Q.V) Attempt the following:

x) Define 1) null hypothesis 2) Alternate hypothesis. (3)

y) Construct chart for mean for the data given below and comment. (Given $A_2 = 0.577$) (6)

Sample No.	1	2	3	4	5	6	7
Mean X:	5.1	5.53	5.42	5.34	5.4	5.21	5.5
Sample range:	1	1.6	2	2.4	1.5	1.9	1.8

z) Construct a control chart for range for the following data of 10 samples containing 5 items each. (7)
($D_3 = 0$, $D_4 = 2.115$)

Sample no.	1	2	3	4	5	6
Sample range:	0.2	0.1	0.56	0.22	0.14	0.21

*****ALL THE BEST*****