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GOPAL GOVIDND POY RAITURCAR COLLEGE OF COMMERCE AND ECONOMICS
PONDA-GOA

B.C.A. (SEMESTER-III)(Old Syllabus) EXAMINATION, OCTOBER 2012
BCA 34 – PROBABILITY AND STATISTICS

Duration: 2hrs Max. Marks: 50

INSTRUCTIONS:

1. All questions are compulsory, however internal choice is provided.
2. Use of calculators is permitted.
3. Graph paper will be provided when asked.

Q.1.

A. Draw scatter diagrams for when the coefficient of correlation is r = 1 and r = -1. (2)

B. With the usual notations, find p for a binomial random variable X if n = 6 and if 9P(X = 4) = P(X = 2) (3)

C. Calculate the standard deviation for the following data: (5)

Marks in Cost Accounting	*No. of Students*	*Marks in Cost Accounting*	*No. of Students*
0-10	5	40-50	9
10-20	7	50-60	6
20-30	14	60-70	2
30-40	12		

OR

Q.I.

i. Let b_{xy} and b_{yx} stand for the coefficients of regression of X on Y and Y on X respectively. Show that: $r_{xy} = \sqrt{b_{xy}.b_{yx}}$ (2)

ii. If a random variable X follows Poisson distribution such that P(X = 1) = P(X = 2) find the mean and variance of the distribution, and P(X = 0). (3)

iii. The arithmetic mean height of 50 students of a college is 5'8". The height of 30 of these is given in the frequency distribution below. Find the arithmetic mean height of the remaining 20 students. (5)

Height in inches:	5'4"	5'6"	5'8"	5'10"	6'0"
Frequency:	4	12	4	8	2

Q.2.

A. For the data given below, find the missing frequency if the Arithmetic Mean is ₹ 33. Also find the median of the series: (5)

Loss per shop (₹):	0-10	10-20	20-30	30-40	40-50	50-60
No. of shops:	10	15	30	-	25	20

B. In a bolt factory machines A, B and C manufacture respectively 20%, 30% and 50% of the total of its output. Of them 5, 4 and 2 per cent respectively are defective bolts. A bolt is drawn at random from the product and is found to be defective. What is the probability that it was manufactured by machine B? (5)

OR

Q. II.

i. From the prices of X and Y of share A and B respectively given below, state with proper justification which share is more stable in value: (5)

X:	55	54	52	53	56	58	52	50	51	49
Y:	108	107	105	105	106	107	104	103	104	101

ii. A committee of 4 persons is to be appointed from 3 officers of the production department, 4 officers of the purchase department, two officers of the sales department and 1 chartered accountant. Find the probability of forming the committee in the following manner: (5)

a) There must be one from each category.
b) It should have at least one from the purchase department.
c) The chartered accountant must be in the same committee.

Q.3.

A. The mean and standard deviation of the wages of 6000 workers engaged in a factory are ₹ 1,200 and ₹ 400 respectively. Assuming the distribution to be normal, estimate:

(i) Percentage of workers getting wages above ₹ 1,600.
(ii) Number of workers getting wages between ₹ 600 and ₹ 900.
(iii) Number of workers getting wages between ₹ 1,100 and ₹ 1,500.

The relevant extract of the Area Table (under the normal curve) from Z = 0 to Z = z is given below:

Z	0.25	0.5	0.6	0.75	1.00	1.25	1.5
Area:	0.0987	0.1915	0.2257	0.2734	0.3413	0.3944	0.4332

(5)

B. Ten competitors in a beauty contest are ranked by three judges in the following order:

1st Judge:	1	6	5	10	3	2	4	9	7	8
2nd Judge:	3	5	8	4	7	10	2	1	6	9
3rd Judge:	6	4	9	8	1	2	3	10	5	7

Use the rank correlation coefficient to determine which pair of judges has the nearest approach to common tastes in beauty. (5)

OR

Q.III.

i. The mean and variance of a binomial distribution are 3 and 2 respectively. Find the probability that the variate takes values (i) less than or equal to 2, (ii) greater than or equal to 7. (5)

ii. From the following data calculate the rank correlation coefficient:

X:	48	33	40	9	16	16	65	24	16	57
Y:	13	13	24	6	15	4	20	9	6	19

(5)

Q.4.

A. Calculate Karl Pearson's coefficient of correlation from the following data: (5)

		Percentage of Marks	
No.	Subject	First Term	Second Term
1	Hindi	75	62
2	English	81	68
3	Economics	70	65
4	Accounts	76	60
5	Commerce	77	69
6	Mathematics	81	72
7	Statistics	84	76
8	Costing	75	72

B. A random sample of 700 units from a large consignment showed that 200 were damaged. Find (i) 95%; (ii) 99% and (iii) 99.73% confidence limits for the proportion of damaged units in the consignment. (5)

OR

Q.IV.

i. Obtain the equations of the two lines of regression for the data given below:

X:	1	2	3	4	5	6	7	8	9
Y:	9	8	10	12	11	13	14	16	15

(5)

ii. A manufacturer claimed that at least 95% of the equipment which he supplied to a factory conformed to specifications. An examination of a sample of 200 pieces of equipment revealed that 18 were faulty. Test this claim at a significance of 5% and 1%. (5)

Q.5.

A. Before an increase on excise duty on tea, 400 people out of a sample of 500 persons were found to be tea drinkers. After an increase in duty, 400 people were tea drinkers in a sample of 600 people. Test the hypothesis that there is a significant decrease in the consumption of tea at (i) 0.05 and (ii) 0.01 level of significance. (5)

B. Five defective mangoes are accidentally mixed with twenty good ones and by looking at them it is not possible to differentiate between them. Four mangoes are drawn at random from the lot. Find the probability distribution of X, the number of defective mangoes. (5)

OR

Q.V.

i. The mean height of 50 male students who showed above average participation in college athletics was 68.2 inches with a standard deviation of 2.5 inches; while 50 male students who showed no interest in such participation had a mean height of 67.5 inches with a standard deviation of 2.8 inches. Test the hypothesis that male students who participate in college athletics are taller than other male students. (5)

ii. A die is tossed twice. Getting 'a number greater than 4' is considered a success. Find the mean and variance of the probability distribution of the number of successes. (5)

Best of Luck!!