

**Goa Vidyaprasarak Mandal's**  
**Gopal Govind Poy Raiturcar College of Commerce and Economics**  
**PONDA-GOA**

**B.C.A. (SEMESTER-III) EXAMINATION (OLD SYLLABUS), OCTOBER 2013**  
**BCA 34 - PROBABILITY AND STATISTICS**

Duration: 2 hours

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  $r = 0$ . What does this value of  $r$  suggest about the relationship between the two variables? (2)
- B. Find  $n$ ,  $p$  and  $q$  if mean of a binomial distribution is 4 and variance is 3. (3)
- C. Calculate the quartiles for the following data: (5)

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
$f$	5	7	14	12	9	6	2

OR

- Q.1.i) Distinguish between positive and negative correlation. (2)
- ii) A coin is tossed six times. What is the probability of getting 4 or more heads? (3)
- iii) The following table gives the distribution of monthly income of 600 families in a city; calculate the mean. (5)

Monthly income	0-75	75-150	150-225	225-300	300-375	375-450	450-525
No. of families	69	167	207	65	58	24	10

- Q.2.A) Find  $D_3$  and  $P_{74}$  for the data given below: (5)

Class interval	10-20	20-30	30-40	40-50	50-60
Frequency	15	10	14	12	24

B. A factory has three units A, B and C. A produces 25% of its products, B produces 25% and unit C produces 50%. If the percentage of defective items produced by these three units A, B and C are respectively 1%, 2% and 3% and an item is selected at random from the total production of the factory is found to be defective, what is the probability that it was produced by unit C? (5)

OR

Q. II.i) Compute the standard deviation of the marks obtained by 100 students in an examination: (5)

Marks	0-10	10-20	20-30	30-40	40-50
No. of students	12	21	23	34	10

ii) A bag contains 4 white and 5 black balls. Two balls are drawn at random without replacement from the bag. What is the probability that: (a) both of them are white; and (b) one is white and the other black. (5)

Q.3.A. The income distribution of a group of 1,00,000 persons was found to be normal with a mean of ₹ 750 and standard deviation of ₹ 50. What percentage of this group has income: (i) exceeding ₹ 668; and (ii) exceeding ₹ 832? (Given for standard normal variate  $t$ , the area between  $t = 0$  and  $t = 1.64$  is 0.4382) (5)

B. Calculate rank correlation coefficient from the following data: (5)

X	52	34	47	65	52	34	52	65
Y	65	59	65	68	60	68	57	68

OR

Q.III.(i) A variate follows Poisson distribution with variance 5. Find  $P(x=0)$ ;  $P(x \geq 1)$ ;  $P(x=1)$  and  $P(x \neq 0)$ . (Given  $e^{-5} = 0.00674$ ,  $e^5 = 148.41$ ) (5)

(ii) If the two regression equations are  $5y = 4x + 33$  and  $20x = 9y + 107$ , find their point of intersection, and the value of correlation coefficient. (5)

Q.4.A) Calculate Karl Pearson's coefficient of correlation from the following data: (5)

X	77	54	27	52	14	35	90	25	56	60
Y	35	58	60	40	50	40	35	56	34	42

B) State the 95% confidence interval for population mean  $\mu$ . A manufacturer claims that at least 95% of the items produced by his firm are good. An examination of 200 pieces of items revealed that 18 were defective. Test the claim at 1% level of significance. (5)

**OR**

Q.IV.i) Estimate the value of X corresponding to  $Y = 200$  for the following data: (5)

X	250	248	297	338	463	393
Y	137	147	184	196	276	260

ii) The height of ten students selected at random, had a mean of 158 cms, and variance of 39cms. Assuming L.O.S of 5%, test the hypothesis that the students of the population are on the average of height less than 162.5 cms. (5)

Q.5.A) A coin is tossed 900 times and heads appears 490 times. Does it support the hypothesis that the coin is unbiased? (5)

B) A player tosses 3 fair coins. He wins ₹ 5 if 3 heads appear, ₹ 3 if two heads appear and Re. 1 if one head appears. On the other hand, he loses ₹ 15 if 3 tails occur. Find his expected gain. (5)

**OR**

Q.V.i) In a sample survey of 1000 students in a college 23% preferred Samsung mobile phones. Find the 99% confidence limits for the percentage of all students in the college preferring that brand of mobile phones. (5)

ii) If for a Poisson distribution  $P(1)=P(2)$ , find mean and standard deviation. (5)

**Best of Luck!!**