Goa Vidyaprasarak Mandal's
Gopal Govind poy Raitur car College of Commerce and Economics, Ponda - Goa

BCA (semester-IV) Supplementary Examination, May/June 2018

DATA ANalysis AND STATISTICAL TECHNIQUES

Duration: 2 Hours Marks: 50

Instructions: standard normal distribution table and t-distribution table will be given.
Answer the following questions. Justify your answer.

Q1 A fair coin is tossed 4 times. Define the sample space corresponding to this random experiment. Also give the subsets corresponding to the following events and find the respective probabilities:
(a) More heads than tails are obtained
(b) Tails occur on the even numbered tosses. (5)

Q2. A lot consists of 10 good articles, 4 with minor defects and 2 with major defects. Two articles are chosen from the lot at random (without replacement). Find the probability that (i) both are good, (ii) both have major defects, (iii) at least one is good (iv) at most one is good (v) exactly one is good. (5)

Q3. A bolt is manufactured by 3 machines A, B and C. A turns out twice as many items as B, and machines B and C produce equal number of items. 2% of bolts produced by A and B are defective and 4% of bolts produced by C are defective. All bolts are put into one stockpile and 1 is chosen from this pile. what is the probability that it is defective? (5)

P.T.O.

Q4 (a) Let X be a random variable with mean = 40 and standard deviation = 5. Find the following probabilities.

$P(x > 55)$ and $P(x < 49)$

(b) Let X be a continuous random variable that has normal distribution with $\mu = 50$ and $\sigma = 8$

Find the probability $P(30 \leq x \leq 39)$

(c) Let X be a continuous random variable that has normal distribution with mean = 80 and standard deviation = 12. Find the area under the ~~standard~~ normal distribution curve

(a) From $x = 70$ to $x = 135$ (b) to the left of 27

(5)

Q5 Fit a straight line $y = a + bx$ to the following data by the method of least squares. Take x as independent variable

x	-3	-2	-1	1	2	3
y	-5	-3	-1	3	5	7

(5)

Q6 Check if the sample size is large enough to use the normal distribution to make a confidence interval for p for each of the following cases.

(a) $n = 50$ and $\hat{p} = .25$, (b) $n = 160$ and $\hat{p} = .03$

(c) $n = 400$ and $\hat{p} = .65$ (d) $n = 75$ and $\hat{p} = .06$

(5)

Q7. A data set produced the following information.

$N = 250$, $\Sigma x = 9880$, $\Sigma y = 1456$,

$\Sigma xy = 85080$, $\Sigma x^2 = 485870$

$\Sigma y^2 = 135675$

Find the linear correlation coefficient. (5)

Q8. Given the following data of the past 10 weeks,

15, 9, 8, 7, 6, 9, 14, 3, 6, 9

(a) Determine the values of the three quartiles and the interquartile range. where does the value of 10 fall in relation to these quartiles?

(b) Calculate the approximate value of the 55th percentile.

(c) Find the percentile rank of 7. (5)

Q9 The database given below has five transactions.

Transaction id	items bought
1	M, O, N, K, e, y
2	D, O, N, K, e, y
3	M, A, K, e
4	M, U, C, K, y
5	C, O, K, i, e

Given minsup = 60%, calculate all frequent itemsets of size one. (5)

P.T.O

Q10. A random variable X has the following probability distribution

x	-2	-1	0	1	2	3
$p(x)$	0.1	K	0.2	$2K$	0.3	$3K$

(a) Find K (b) Evaluate $P(X<2)$

(c) Evaluate the mean of X (5)
