C 83009 (Pages : 3) Name.....

Reg. No.....

SECOND SEMESTER B.C.A. DEGREE EXAMINATION, MAY 2015

(CUCBCSS—UG)

Complementary Course

BCA 2C 03—COMPUTER ORIENTED STATISTICAL METHODS

Time : Three Hours Maximum : 80 Marks

Section A

Answer all **ten** *questions.*

1. The pair (X,Y) takes values (5, 8) and (-1, 2). Then the correlation between X and Y is :

   (a) 0. (b) 1.

   (c) —1. (d) Cannot say.

2. The limiting relative frequency approach of probability is known as :

   (a) Axiomatic probability. (b) Classical probability.

   (c) Statistical probability. (d) A priori probability.

3. If P (X 5 M) = P(X ≥ M), then M is :

   (a) A.M. (b) Median.

   (c) G.M. (d) H.M.

4. For a Poisson distribution which of the following is true ?

   (a) Mean < Variance. (b) Mean > Variance.

   (c) Mean ≥ Variance. (d) Mean = Variance.

5. The Level of significance is the probability of :

   (a) Type I error. (b) Type II error.

   (c) Not committing an error. (d) None of the above.

6. The empirical relation between Mean, Median and mode is ————

7. ————is a measure of dispersion which utilizes only extreme values.

8. If A and B are two events and their union is the sample space, then $P(A \cap B^e) =$ ————

9. If X_1 and X_2 are two independent standard normal variables, then the ratio of their squares follows _____ distribution.

10. 1-Probability of type II error is called ————

(10 x 1 = 10 marks)

Turn over

Section B

Answer all **five** *questions.*

11. What is an average ? Define AM, GM, HM.

12. Define mutually exclusive events and independent events. Give one example for each.

13. Define r' raw moment and r' central moment. Evaluate the first two of each.

14. Distinguish between statistic and parameter. Give an example for each.

15. Define two types of errors.

(5 x 2 = 10 marks)

Section C

Answer any **five** *questions.*

16. Find the A.M and Median of the following data :—

Class	... O – 10	10 – 20	20 – 30	30 – 40	40 – 50
Frequency	6	14	20	12	8

17. Find the quartile deviation of the data given below :

X	10	20	30	40	50	60	70	80
Frequency ...	6	12	15	20	12	10	8	7

18. Fit the line Y = A + BX :

X	1	2	3	4	5	6	7	8	9	10
Y ...	5.5	8	10.5	13	15.5	18	20.5	23	25.5	28

19. Write the p.m.f. of Poisson distribution with mean X, . Evaluate the probabilities for X = 0, 1, 2 when X = 2.

20. Derive the m.g.f. of binomial distribution. Hence find its mean and variance.

21. Define *t*, x^2 and F distributions.

22. Distinguish between point estimate and interval estimate. Write the 95% confidence interval for the mean and variance of normal population.

23. Find the mean and variance of the following distribution :—

X	2	4	6	8	10.	12	14	16
p	.01	.01	.01	.02	.02	.01	.01	.01

(5 x 4 = 20 marks)

Section D

Answer any five *questions.*

24. Compute Karl Pearson's correlation coefficient :

X ...	4	10	11	12	12	15	18	20	21	22
Y	3	12	18	20	21	28	32	18	35	30

25. Find the coefficient of variation for the following data :

Class ...	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60
Frequency ...	5	12	18	15	12	8

26. If $f(x, y) = ex$, $0 < x, y < \infty$, find the conditional distributions of X given Y and Y given X.

27. A random sample of size 64 is taken from a normal distribution with mean 100 and standard deviation 80. Find :

(a) $Pa < 80)$; (b) $P(80 < X < 120)$ (c) $P(\bar{X} > 90)$.

28. The probability of a light bulb produced by a company is defective is .001. In a box contains 100 bulbs. In a consignment of 1000 boxes how many boxes will have : (i) no defective ; (ii) exactly **1** defective.

29. In a survey, 1200 persons selected at random were asked their opinion whether an MP's term is to be limited to 3 years in the parliament. Out of this sample, 780 persons opined Yes. Construct a 995 confidence interval of the corresponding true proportion regarding such opinion of all persons.

30. Explain the desirable properties of an estimate. Give examples.

31. A movie house is filled with 700 people and 60% of these are females, 70% of these people are seated in the no smoking area including 300 females. What is the probability that a person selected at random in the movie house is : (a) a male ; (b) a female smoker ; (c) a male or a non-smoker and ; (d) a smoker if we knew that the person is a male ?

(5 x 8 = 40 marks)