C 62632 (Pages : 3) Name ....

Reg. No

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, MAY 2019

B.C.A.

BCA 2C 03—COMPUTER ORIENTED STATISTICAL METHODS

(2014 Admissions)

Time : Three Hours Maximum : 80 Marks

Part A

Answer **all** *questions.*
Each question carries 1 mark.

1. Sum of deviations observations from their arithmetic mean is [redacted]
2. [redacted] is the [redacted]aphical method studying dispersion.
3. Set of all possible outcomes of a random experiment is known as [redacted]
4. Three unbiased coins are tossed [redacted] is th[redacted]probability of getting at least one head.
5. Two random variables are said to be independent if $f(x, y) =$ ——————
6. A distribution for which mean is greater than variance is ——————
7. Standard deviation of sampling distribution of a statistic is called ——————
8. The square of Standard. Normal distribution is [redacted]
9. The joint distribution of sample observations is called [redacted]
10. If t_n is consistent for 0, t_n^2 is consistent. for ——————

(10 x 1 = 10 marks)

Part B (Short Answer Type Questions)

Answer **all** *questions.*
Each question carries 2 marks.

11. For any *two* positive numbers, prove that $AH = G^2$, where A is the arithmetic mean, G is the geometric mean, and H is the harmonic mean.
12. Give classical definition of probability.
13. Define random variable and give two examples.

Turn over

14. Define F-statistiL

15. What is a mean by a statistical hypothesis? Explain simple and composite hypothesis.

(5 x 2 = 10 marks)

Part C (Short Essay Type Questions)

Answer any five *questions.*
Each question carries 4 *marks,*

16. Explain the method of constructing a Lorenz curve.

17. Prove that standard deviation is independent of change of origin, but not of scale.

18. Let B c_ A, prove that (i) P (A nB^c) = P (A) P (B) ; and (ii) P (B) P (A).

19. The p.d.f, of a random variable X is given by $f(x) = kx(1-x)$; $0 < x$ 1:

    (i) Find the value of k.

    (ii) Obtain the distribution function of X.

20. Define the moment generating function of a random variable. Explain how you will obtain moments from a moment generating function.

21. Obtain the sampling distribution of mean of the samples from a Normal population.

22. Obtain the interval estimate of variance of a Normal population.

23. Obtain the maximum likelihood estimator of parameter of a Poisson population.

(5 x 4 = 20 marks)

Part **D (** Essay Questions)

Answer any five *questions.*
Each question carries 8 *marks.*

24. Obtain the co-efficient variation for following data :

Length of life (in hours) :	500-700	700--900	900-1100	1100-1300	1300-1500
No.of bulbs	5	11	26	10	8

25. Fit a straight line to the following data :

Year	1992	1994	1996	1998	2000	2002	2004
Production	77	81	88	94	94	96	98

26. Find the co-efficient of correlation between X and Y from the following data :

X	15.5	16.5	17.5	18.5	19.5	20.5
	75	60	50	50	45	40

27. The two lines of regression are given by 8x -10y 4- 66 = 0 and 40x -18y = 214 :

(a) Identify the regression lines.

(b) Find the mean values of X and Y.

(c) Find the correlation co-efficient between X and Y.

(d) Find the standard deviation of Y, if the standard deviation of X is 3.

28. From a group of 3 Indians, 4 Pakistanis and 5 Americans, a sub-committee of four peoples is selected by lots. Find the probabilities that the sub-committee will consist of :

(a) 2 Indians and 2 Pakistanis.

(b) 1 Indian, 1 Pakistani and 2 Americans.

(c) At least one Indian.

29. A random variable X has the p.m.f. given by :

X	-3	-1	0	1	2	3
f (x)	k^2	$2k^2 + k$	$2k^2 + 3k$	$4k^2 + 5k$	$3k^2 + 3k$	$2k^2 + k$

(a) Find the value of k.

(b) Obtain the distribution function of X

(c) Find P (X > 1) and P (X 5 2).

30. From a Normal population N 6^2), obtain :

(a) The MLE of p when 6^2 is known.

(b) The MLE of 0^2 whenμ is known.

31. Let $x_1, x_2, \ldots, x_9$ is a random sample of size nine taken from a Normal population N 25). To test H_o : μ = 5 against H_1 : p, = 6, the critical region suggested is 7 where x is the sample mean. Find the significant level and power of the test.

(5 x 8 = 40 marks)