

C 81758

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Name.....

Reg. No.....

SECOND SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION, APRIL 2020

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. The relation between A.M., G.M. and H.M. is _____.
2. Sum of squares of the deviations is minimum when deviations are taken from _____.
3. If $P(A) = p_1$, $P(B) = p_2$ and $P(A \cap B) = p_3$, then $P(A|B) =$ _____.
4. The probability that a leap year will have 53 sundays is _____.
5. Two random variables X and Y with density functions $f(x)$ and $f(y)$ respectively are said to be independent if $f(x, y) =$ _____.
6. For a _____ distribution, mean and variance are same.
7. Let $X \sim N(\mu, \sigma^2)$, then the central moments of odd order are _____.
8. The independence between two attributes is tested with the help of _____ distribution.
9. If an estimator T_n of population parameter θ converges in probability to θ as n tends to infinity, is said to be _____.
10. If β is the probability of type II error, then the power of the test is _____.

(10 × 1 = 10 marks)

Part B (Short Answer Type Questions)

Answer all questions, each question carries 2 marks.

11. Define the term Regression.
12. Define the intersection of two events.

Turn over

13. What is meant by probability density function ?
14. Distinguish between estimator and estimate.
15. State Neyman-Pearson Lemma.

(5 × 2 = 10 marks)

Part C (Short Essay Type Questions)

(Answer any five questions, each question carries 4 marks.)

16. Explain Lorenz curve.
17. How can the regression lines be identified ?
18. Explain classical definition of probability and give its defects.
19. Distinguish between discrete and continuous random variables. Give two examples each.
20. X is a random variable for which $E(X) = 10$ and $V(X) = 25$. Find the positive values of a and b such that $Y = aX - b$ has expectation 0 and variance 1.
21. What do you mean by 'sampling distribution' of a statistic ? Give an example. Also define standard error.
22. Derive the 95% confidence interval for the variance of a normal population.
23. Define : <https://www.keralaguru.com>

(1) critical region ; (2) significance level ; (3) null hypothesis ; (4) power of a test.

(5 × 4 = 20 marks)

Part D (Essay Questions)

(Answer any five questions, each question carries 8 marks.)

24. Find mean, median and mode for the following data :

Class	:	5-9	10-14	15-19	20-24	25-29	30-34	35-39
Frequency	:	8	12	23	12	7	5	3

25. Compute Karl-Pearson's co-efficient of correlation for the following data :

x	:	2	3	4	5	6	7	8
y	:	4	5	6	12	9	5	4

26. The ranking of 10 individuals at the start and at the finish of a course of a training are as follows :

Individuals	A	B	C	D	E	F	G	H	I	J
Rank before	1	6	3	9	5	2	7	10	8	4
Rank after	6	8	3	2	7	10	5	9	4	1

Calculate the rank correlation coefficient.

27. From the following results, estimate the yield of crops when the rainfall is 22 cms and the rainfall when the yield is 600 kgs

	Rainfall in cms (X)	Yield in kgs (Y)
Mean	26.7	508.4
S.D.	4.6	36.8

Co-efficient of correlation between rainfall and yield is 0.52

28. Two balls are drawn from an urn containing six balls of which 4 are white and 2 are red. Find the probability that

- (a) both balls are white.
- (b) both balls are of the same colour
- (c) at least one of the balls is white

29. Find c if $p(x) = c \left(\frac{2}{3}\right)^x$; $x = 1, 2, 3, \dots$ is a probability distribution. Also find

$$P(1 < X < 3) \text{ and } P(X \geq 3)$$

30. For random sampling from normal population $N(\mu, \sigma^2)$, find m.l.e. for (1) μ when σ^2 is known ;
(2) σ^2 when μ is known.
31. The diameters of 200 ball-bearings made by a mechanic during a week were found to have a mean 0.824 and standard deviation 0.042. Find 90% and 95% confidence intervals for the mean diameter of the ball-bearings.

(5 × 8 = 40 marks)