

D 91724

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Name.....

Reg. No.....

**THIRD SEMESTER (CUCBCSS—UG) DEGREE EXAMINATION
NOVEMBER 2020**

B.C.A.

BCA 3C 05—COMPUTER ORIENTED NUMERICAL AND STATISTICAL METHODS

(2017 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A

Answer all questions.

Each question carries 1 mark.

1. What is the accuracy of the number 95.763 ?
2. What do you mean by Round-off errors ?
3. Give the form of an algebraic equation.
4. What is the empirical relationship between Mean, Median and Mode ?
5. When mode is said to be ill-defined ?
6. Define standard deviation ?
7. Give the formula for finding Karl Pearson's co-efficient of correlation ?
8. What do you mean by a random experiment ?
9. Define discrete and continuous random variables.
10. What are the properties of a distribution function ?

(10 × 1 = 10 marks)

Part B

Answer all questions.

Each question carries 2 marks.

11. What do you mean by the method of false position ?
12. Give the Trapezoidal rule.

Turn over

13. Calculate Arithmetic mean for the following data :
10, 90, 85, 103, 11, 29, 84, 15, 35, 80
14. Explain Lorenz curve with its procedures of drawing ?
15. Define Harmonic mean with its formula.
16. What do you mean by Q.D ?
17. What you mean by Principle of least squares ?
18. Give the relationship between correlation co-efficient and regression co-efficients.

(8 × 2 = 16 marks,)

Part C

Answer any six questions.

Each question carries 4 marks.

19. Find a root of the equation $x^2 - 4x - 10 = 0$ using bisection method ?
20. Compute the integral $\int_{-1}^1 e^x dx$ using composite trapezoidal rule for (a) $n = 2$ and (b) $n = 4$.
21. Given the data :

X	:	1.2	1.3	1.4	1.5
$f(x)$	:	1.063	1.091	1.119	1.145

Calculate $f(1.35)$ using Newton's Interpolation polynomial of order 1 through 3.

22. Calculate Median for the following data : <https://www.keralaguru.com>

Size	:	0-5	5-10	10-15	15-20	20-25	25-30
Frequency	:	20	24	32	28	20	26

23. Find the Geometric mean of 1.05, 1.08, 2.01, 3.05, 4.01.
24. Find Spearman's Rank Correlation Co-efficient between Poverty and Overcrowding :

Poverty	:	17	13	15	16	6	11	14	9	7	12
Overcrowding	:	36	46	35	24	12	18	27	22	2	8

25. In the study of regression equations, following values were obtained. (a) Regression co-efficient of y on $x = 0.25$, $r = 0.42$, $\sigma_y = 4$, find S.D. of x . (b) Out of the two lines of regression given by $x + 2y - 5 = 0$ and $2x + 3y - 8 = 0$, which one is the regression line of x on y ?
26. Define the probability density function and distribution function of a discrete random variable with examples of each.
27. Represent the Union, Intersection and complement of two events A and B by using Venn diagrams.

(6 × 4 = 24 marks)

Part D

*Answer any three questions.
Each question carries 10 marks.*

28. Find roots of the equation $f(x) = x^2 - 2x - 1$ by using Newton-Raphson method.
29. Find Mode for the following data :
- | | | | | | | | |
|-----------|---|------|-------|-------|-------|-------|-------|
| Marks | : | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 |
| Frequency | : | 5 | 15 | 0 | 40 | 32 | 2 |
30. Derive false-position formula and use the same repeatedly to find the roots of the equation $\sin(x) - x + 2 = 0$.
31. From the following data, form the two regression equations and find the value of y when $x = 16$:
- | | | | | | | | | | | | |
|-----|---|----|----|----|----|----|----|----|----|----|----|
| x | : | 36 | 23 | 27 | 28 | 28 | 29 | 30 | 31 | 33 | 35 |
| y | : | 29 | 18 | 20 | 22 | 27 | 21 | 29 | 27 | 29 | 28 |
32. Find Karl Pearson's co-efficient of correlation for the following data :

Price	:	100	90	85	92	90	84	88	90
Sales	:	600	610	700	630	670	800	800	750

(3 × 10 = 30 marks)

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