

D 71665

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Name.....

Reg. No.....

THIRD SEMESTER B.A./B.Sc. DEGREE EXAMINATION, NOVEMBER 2019

(CUCBCSS—UG)

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 number of Significant digits of the number 0.0002932 ?
2. What are inherent errors ?
3. What do you mean by a polynomial equation ?
4. How will you find A.M. in the equation of a continuous frequency table ?
5. Define Range.
6. How will you find the Standard deviation ?
7. Give any *two* properties of correlation co-efficient.
8. Write the normal equations corresponding to a straight line of the form $y = a + bx$.
9. Define sample space of a random experiment.
10. What do you mean by intersection of two events ?

(10 × 1 = 10 marks)

Part B

Answer all questions.

Each question carries 2 marks.

11. Find the linear interpolating polynomial for the set of points (-1, 1), (0, 1) and (1, 3).
12. Give the formula used in False Position Method.
13. How is Newton's Interpolation better than Lagrange formula ?

Turn over

14. Show that the Newton-Raphson Method converges to the solution quadratically.
15. Find median of the values :
17, 32, 35, 33, 15, 21, 41, 32, 11, 10, 20
16. Find H.M for the following data :
- | | | | | | |
|-----------|---|----|----|----|----|
| Size | : | 6 | 10 | 14 | 18 |
| Frequency | : | 20 | 40 | 30 | 10 |
17. What are the merits and demerits of Range ?
18. Write the Pdf of throwing a die.

(8 × 2 = 16 marks)

Part C*Answer any six questions.**Each question carries 4 marks.*

19. Find the root of the equation by using Bisection Method $e^x - x - 2 = 0$.
20. Find the roots of the equation $f(x) = x^2 - 3x + 2$ by taking $x_1 = 0$ as initial value using Newton Raphson Method.
21. Find the square root of 2.5 using the Second Order Lagrange Interpolation Polynomial.
22. Construct difference tables for the following data :
- | | | | | | | | | |
|--------|---|------|------|-------|-------|-------|-------|------|
| x | : | 0.1 | 0.3 | 0.6 | 0.9 | 0.9 | 1.1 | 1.3 |
| $f(x)$ | : | .003 | .067 | 0.148 | 0.248 | 0.310 | 0.518 | .697 |
23. Find Median for the data :
- | | | | | | | | | |
|-----------|---|-----|-----|-----|-----|------|-------|-------|
| Marks | : | 0-2 | 2-4 | 4-6 | 6-8 | 8-10 | 10-12 | 12-14 |
| Frequency | : | 42 | 26 | 26 | 35 | 60 | 45 | 50 |
24. Why S.D is considered to be the best measure of dispersion ?
25. Find S.D for the following data :

| | | | | | | |
|-----------|---|---|----|----|---|----|
| Size | : | 2 | 4 | 6 | 8 | 10 |
| Frequency | : | 8 | 10 | 16 | 9 | 7 |

26. Find Karl Pearson's co-efficient of correlation for the following data :

| | | | | | | |
|--------|---|---|---|---|---|----|
| Price | : | 7 | 8 | 9 | 6 | 5 |
| Demand | : | 8 | 9 | 7 | 9 | 10 |

27. Write the P.d.f. corresponding to the sum of the two faces turning up when two dice are thrown.

(6 × 4 = 24 marks)

Part D

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

28. Use the False-position formula repeatedly to obtain the roots of (a) $x - e^{-x} = 0$. (b) $4x^3 - 2x - 6 = 0$.

29. Calculate Mode for the following data :

| | | | | | | | | | | |
|-------------------|---|----|----|----|----|----|----|----|----|----|
| Marks (less than) | : | 10 | 20 | 30 | 40 | 50 | 60 | 70 | 80 | 90 |
| Frequency | : | 4 | 9 | 15 | 18 | 26 | 30 | 38 | 50 | 54 |

30. Find Q.D for the following data :

| | | | | | | | | |
|-----------|---|------|-------|-------|-------|-------|-------|-------|
| Size | : | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 |
| Frequency | : | 8 | 10 | 20 | 25 | 30 | 26 | 24 |

31. For the data given below between x and y , find (a) Correlation co-efficient between x and y
(b) Form the two regression equations :

| | | | | | | | | | | | |
|-----|---|----|----|----|----|----|----|----|----|----|----|
| x | : | 12 | 20 | 15 | 22 | 18 | 24 | 20 | 12 | 15 | 22 |
| y | : | 30 | 35 | 28 | 36 | 29 | 39 | 30 | 25 | 30 | 38 |

32. (a) Evaluate the integral $\int_{-1}^1 e^x dx$ using Simpson's $(1/3)^{rd}$ rule.

(b) Use Trapezoidal rule with $n = 4$ to estimate $\int_0^1 \frac{dx}{(1+x^2)}$.

(3 × 10 = 30 marks)