

**GS-638**

II Semester B.C.A. Examination, May/June - 2019

COMPUTER SCIENCE

BCA-205 : Numerical and Statistical Methods
(CBCS) (Fresh+Repeaters) (2014-15 & Onwards)

Time : 3 Hours

Max Marks : 100

Instructions : Answer **all** sections.**SECTION - A**I. Answer **any Ten** questions of the following.**10x2=20**

1. Multiply $+0.3423E12 \times 0.3215E-15$.
2. Mention four types of errors.
3. Write the formula for Newton-Raphsen method.
4. Construct the forward difference table for the following table.

X	-3	-2	1	3	5
f(x)	-18	2	-2	18	110

5. Write the lagrange interpolation formula.
6. Explain Gauss- Elimination method for solving system of linear equations.
7. Explain Doolittle method of solving linear equations of the form $AX=B$.

8. Find the harmonic mean of the following

X	5	10	15	20	25
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9. Define correlation.
10. Find the co-efficient of variation given that mean is 1.2 and S.D is 1.378.
11. If $P(B) = 1/5$ and $P(A \cap B) = 1/4$ then find $P(A/B)$.
12. Find the area under the standard normal curve between $z=0$ and $z=1.55$.

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SECTION - B

6x5=30

II. Answer any Six of the following.

13. Determine the single - precision machine representation of the decimal number 42.234375 in both single precision and double precision.

14. Find a real positive root of the equation $x^3 - x - 1 = 0$ lying between 1 and 2 using bisection method in five stages.

15. Find $f(1.4)$ from the following data:

x	1	2	3	4	5
$f(x)$	10	26	58	112	194

16. Using Lagrange's formula find $f(10)$ from the following data:

x	5	6	9	11
$f(x)$	12	13	14	16

17. Evaluate $\int_0^6 \frac{dx}{1+x^2}$ by using Trapezoidal rule.

18. Evaluate $\int_0^1 \frac{dx}{1+x}$ using Simpson's $\frac{1}{3}$ rule.

19. Solve by Jacobic's iteration method.

$$20x + y - 2z = 17; \quad 3x + 20y - z = -18; \quad 2x - 3y + 20z = 25.$$

20. Solve following system of linear equations using Crout's LU decomposition method.

$$2x + 3y + z = -1; \quad 5x + y + z = 9; \quad 3x + 2y + yz = 11$$



SECTION - C

III. Answer any Six of the following :

6x5=30

21. Solve by Gauss-Seidel iteration method

$$20x + y - 2z = 17; 3x + 20y - z = -18; 2x - 3y + 20z = 25$$

22. Use power method to find the largest eigen value of the matrix

$$A = \begin{bmatrix} 4 & 2 \\ 1 & 3 \end{bmatrix}$$

23. Using Picard's method, solve $\frac{dy}{dx} = x - y^2$, $x_0 = 0, y_0 = 1$, Find $y(0.1)$ Correct to four decimal places.

24. Solve by using Runge-Kutta method for $x = 0.2$ in steps of 0.1, If $\frac{dy}{dx} = x + y^2$ given $y(0) = 1$.

25. Using Taylor's Series method to find y at $x = 1.1$ and 1.2 Considering terms upto third degree given that $\frac{dy}{dx} = x + y$; $y(1) = 0$.

26. Find the mean for the following frequency distribution.

Class	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25	25 - 30	30 - 35
Frequency	2	4	5	3	2	4	5

27. From the following series, compute the value of the Geometric mean.

Marks	20 - 30	30 - 40	40 - 50	50 - 60	60 - 70
No. of Student	5	13	7	11	4

28. Calculate SD from the following data.

x	45	50	55	60	65	70	75	80
f	3	5	8	7	9	7	4	7

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SECTION - D

4x5=20

IV. Answer any Four of the following.

29. Calculate Karl Pearson's Skewness and Co-efficient of Skewness of the following data.

x	10	20	30	40	50	60
y	3	7	10	20	6	4

30. Find the Co-efficient of rank correlation for the following data.

x	65	45	67	38	48	50	26	47	70	62
y	64	40	58	46	52	49	38	47	59	60

31. Two cards are drawn from a well shuffled ordinary deck of 52 cards. Find the probability that they are both aces if the first card is (1) replaced (2) not replaced.

32. If A and B are two events then prove that $P(A/\bar{B}) = \frac{P(A) - P(A/B)}{1 - P(B)}$ where $P(B) \neq 1$.

33. When a coin is tossed 4 times, find the probability of getting
 (1) exactly one head
 (2) atmost 3 heads
 (3) atleast 2 heads.

34. Find the Co-efficient of Correlation for the following data :

x	10	14	18	22	26	30
y	18	12	24	6	30	36