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**DHANALAKSHMI SRINIVASAN COLLEGE
OF ARTS & SCIENCE FOR WOMEN
(AUTONOMOUS)**
(For Candidates admitted from 2020-2021 onwards)



UG DEGREE EXAMINATIONS APRIL - 2021
B.Sc., – COMPUTER SCIENCE & BCA- COMPUTER APPLICATIONS
NUMERICAL ANALYSIS AND STATISTICS

Time: 3 Hrs

Max.Marks: 75

PART - A

CHOOSE THE CORRECT ANSWER**(10X1=10)**

- What are the roots lies between the equation $x^3 - x - 3 = 0$
 - 0 and 1
 - 1 and 2
 - 2 and 3
 - 3 and 4
- In case of newton backward interpolation formula which equation is correct to find u?
 - $(x - x_n) h = u$
 - $x + x_n = uh$
 - $x - x_n = u$
 - $x - x_n = uh$
- The aim of elimination steps in gauss elimination method is to reduce the co-efficient matrix to
 - Diagonal
 - identity
 - lower triangular
 - upper triangular
- The trapezoidal formula is
 - $h/2((y_0 + y_n) + 2A)$
 - $h/2((y_0 - y_n) + 2A)$
 - $h/2((y_0 + y_n) - 2A)$
 - $h/2((y_0 - y_n) - 2A)$
- The general algorithm of Euler 's
 - $y_{n+1} = y_n + h f(x_n, y_n)$
 - $y_{n+1} = y_n + f(x_n, y_n)$
 - $y_{n+1} = y_n - h f(x_n, y_n)$
 - $y_{n+1} = y_n - f(x_n, y_n)$
- Milne's corrector formulais
 - y_n, c
 - $y_{n+1, c}$
 - $y_{n-1, c}$
 - $y_{n-2, c}$
- Sum of mode and median of the data 12,15,11,13,18,11,13,12,13
 - 26
 - 31
 - 36
 - 25
- Harmonic mean is the reciprocal of
 - Arithmetic mean
 - mode
 - harmonic mean
 - median
- The correlation coefficient is the --- of two regression coefficients
 - Geometric mean
 - arithmetic mean
 - harmonic mean
 - median
- Regression coefficient is independent of
 - units of measurement
 - scale and origin
 - both a and b
 - none of them

PART - B

ANSWER ALL THE QUESTIONS

(5X7=35)

11. a) Find the real root of $x^3-3x+1=0$ lying between 1 and 2 upto three decimal places by Newton Raphson method.

(OR)

b) Construct Newton's forward interpolation polynomial for the following data

| | | | | |
|---|---|---|---|----|
| X | 4 | 6 | 8 | 10 |
| Y | 1 | 3 | 8 | 16 |

12. a) Evaluate $\int_0^1 e^{-x^2} dx$ by dividing the range into four equal parts using Trapezoidal rule.

(OR)

b) Solve the following system of equations using gauss elimination method

i. $X+Y+Z=9$

ii. $2X-3Y+4Z=13$

iii. $3X+4Y+5Z=40$

13. a) Using Euler's method solve $y'=1+xy$ with $y(0)=2$. Find $y(0.1),y(0.2),y(0.3)$.

(OR)

b) Given $y'=\frac{1}{x+y}$, $y(0)=2$. If $y(0.2)=2.09$, $y(0.4)=2.17$ and $y(0.6)=2.24$. Find $y(0.8)$ using Milne's method.

14. a) Calculate the arithmetic mean for the following data

| | | | | | | | | |
|-----------------|------|-------|-------|-------|-------|-------|-------|-------|
| Class interval: | 5-10 | 10-15 | 15-20 | 20-25 | 25-30 | 30-35 | 35-40 | 40-45 |
| Frequency : | 6 | 5 | 15 | 10 | 5 | 4 | 3 | 2 |

(OR)

b) From the following data compute quartile deviation

| | | | | | | |
|------------|------|-------|-------|-------|-------|---|
| Size: | 0-10 | 10-20 | 20-30 | 30-40 | 40-50 | |
| Frequency: | 4 | 1 | 5 | 2 | 1 | 7 |

15. a) Calculate the Karl Pearson's co-efficient of correlation from the data given below:

| | | | | | |
|----|----|----|----|----|----|
| X: | 2 | 4 | 6 | 8 | 10 |
| Y: | 12 | 14 | 16 | 18 | 20 |

(OR)

b) Find the regression line of y on x for the following data;

| | | | | | | | |
|----|----|----|----|----|----|----|----|
| X: | 18 | 26 | 28 | 31 | 25 | 19 | 35 |
| Y: | 11 | 16 | 19 | 17 | 14 | 11 | 24 |

PART - C

ANSWER ANY THREE QUESTIONS

(3X10=30)

16. Find a real root of the equation $x^3 - 3x + 1 = 0$ by using bisection method.

17. Solve the following system of equations using gauss seidal method

$$10x + 2y + z = 9;$$

$$X + 10y - z = -22;$$

$$-2x + 3y + 10z = 22$$

18. Use Rungekutta method of the fourth order to find $y(0.1)$, given that $y' = \frac{1}{x+y}$; $Y(0)=1$.

19. The number of telephone calls received in 245 successive one minute intervals at an exchange are shown in the following frequency distribution

No.of.calls: 0 1 2 3 4 5 6 7

Frequency: 14 21 25 43 51 40 39 12

Evaluate the mean, median, mode.

20. From the following data find the co efficient of correlation and obtain the two regression equations;

X: 1 2 3 4 5 6 7 8 9

Y: 9 8 10 12 11 13 14 16 15

