

Bachelor's Degree Examination-- November 2017

I Semester

Class : I UG
Major : Information Technology

Time :3 hours
Max.Marks: 100

15BITI01 DSE – I Algebra and Statistics

Part-A

10x1=10

Choose the correct answer

- The derivative of a^x is
a. $a^x \log a$ b. $\text{Log } a^x$ c. $x a^x$ d. a^x
- If $x=at^2$, $y=2at$ then dy/dx is
a. t b. $1/t$ c. t^2 d. at
- The polynomial $x^3 + x^2 - 1 = 0$, root lies between
a. 1 and 2 b. 0 and 1 c. -1 and 0 d. -1 and -2
- The modification of Gauss elimination method is
a. Gauss Seidal method b. Gauss Jacobi method
c. Gauss Jordan method d. Gauss method
- The sum of the diagonal matrix is called
a. Rank b. Null c. Trace d. Eigen roots
- The order of error in Trapezoidal rule is
a. h b. h^4 c. h^2 d. h^3
- The positional average is
a. Mean b. Mode c. Geometric mean d. Median
- Root mean square deviation is
a. Range b. Standard deviation c. Quartile deviation d. Mean deviation
- Correlation lies in between
a. 0 and 1 b. -1 and 0 c. 1 and 2 d. -1 and 1
- The geometric mean of two regression coefficients is the
a. Correlation coefficient b. Regression equation
c. Rank correlation d. Standard deviation

Part -B

(5x6 =30 Marks)

Answer the following.

- a. Find dy/dx when x and y are connected by the relation $ax^2 + 2hxy + by^2 = c$.
(or)
b. Differentiate $e^{\sin^{-1}x}$ with respect to $\sin^{-1}x$.
- a. Derive the rate of convergence of Newton-Raphson method.
(or)
b. Solve by Gauss elimination method
 $2x+y+z=10$; $3x+2y+3z=18$; $x+4y+9z=16$.

- a. Find the characteristic equation of

$$\begin{bmatrix} 2 & 2 & 0 \\ 2 & 1 & 1 \\ -7 & 2 & -3 \end{bmatrix}$$

(or)

b. Evaluate $\int_0^1 \frac{1}{1-x} dx$ by Trapezoidal rule.

14.a. Find the mean height of the following.

Height (inches) : 60 61 62 63 64

No. Of children: 2 3 5 8 7

(or)

b. Find the quartile deviation of 1490, 692, 777, 335, 582, 488, 753, 384, 407, 672, 522

15. a. Calculate coefficient of rank correlation

X: 10 8 1 2 6 9 3 5 4 7

Y: 6 10 5 4 3 1 2 9 8 7

(or)

b. Find the regression equation of X on Y for the following.

	X	Y
Mean	10	90
Standard Deviation	3	12
Correlation Coefficient	0.8	

Part – C

(5x12 = 60 Marks)

Answer the following.

16. a. If $x(1+y)^{1/2} + y(1+x)^{1/2} = 0$ then prove that $dy/dx = -1/(1+x)^2$.

(or)

$$\frac{(a-x)^2(b-x)^3}{(c-2x)^3}$$

b. Find the differential coefficient of $(c-2x)^3$

17.a. Using Bisection method, find the real root of the equation $x^3 - 2x - 5 = 0$.

(or)

b. Solve by Gauss Seidal method

$$83x + 11y - 4z = 95; 7x + 52y + 13z = 104; 3x + 8y + 29z = 71.$$

18.a. Find the eigen values and eigen vectors of the following

$$\begin{bmatrix} 1 & 1 \\ 3 & -1 \end{bmatrix}$$

b. Compute the values of

$$\int_0^6 \frac{1}{1+x^2} dx \text{ by i) Trapezoidal rule ii) Simpsons rule.}$$

19.a. Calculate mean, median for the following.

X: 10-20 20-30 30-40 40-50 50-60 60-70 70-80 80-90

F: 4 12 40 41 27 13 9 4

(or)

b. Find the mean deviation about the median of the following

x: 10 11 13 14 12

f: 3 12 12 3 18

20. a. Calculate Karl Pearson coefficient of correlation.

X: 20 22 23 25 25 28 29 30 30 34

Y: 18 20 22 24 21 26 26 25 27 29

(or)

b. Calculate the two regression equations.

X: 6 2 10 4 8

Y: 9 11 5 8 7
