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Question Paper Code: 93023

B.E. / B.Tech. DEGREE EXAMINATION, DEC 2020

Third Semester

Electronics and Communication Engineering

19UMA323 - : NUMERICAL ANALYSIS AND LINEAR ALGEBRA

(Statistical tables are may be permitted)

Duration: One hour

Maximum: 30 Marks

PART A - (6 x 1 = 6 Marks)

(Answer any six of the following questions)

1. Trapezoidal rule is so called, because it approximates the integral by the sum of _____ trapezoids CO1- R
(a) n (b) n+1 (c) n-1 (d) 2n
2. Truncation error in Simpson's rule is of the order ____ CO1- R
(a) h^3 (b) h^2 (c) h^4 (d) 0
3. Taylor Series method will be very useful to give some _____ values for RK, Milne's and Adam's methods CO2- R
(a) initial (b) final (c) intermediate (d) two
4. In Euler's method, if h is large then it gives _____ value CO2- R
(a) accurate (b) inaccurate (c) average (d) None of these
5. PDE of second order, if $B^2 - 4AC < 0$ then CO3- R
(a) parabolic (b) elliptic (c) hyperbolic (d) Non homogeneous
6. PDE of second order, if $B^2 - 4AC = 0$ then CO3- R
(a) parabolic (b) elliptic (c) hyperbolic (d) None of these
7. The trivial subspaces of a vector space V are _____ CO4- R
(a) {0} (b) V (c) W (d) {0} and V
8. If $T: V \rightarrow W$ be linear transformation then $T(0) =$ _____ CO4- R
(a) 0 (b) 1 (c) 2 (d) 3

9. In a vector sapace V , if $\langle x, y \rangle = \langle y, z \rangle$ then _____ CO5- R
 (a) $y = z$ (b) $y \neq z$ (c) $y = -z$ (d) none of these
10. The norm of $(3, -4, 0)$ is _____ CO5- R
 (a) 3 (b) -4 (c) 0 (d) 5

PART – B (3 x 8= 24 Marks)

(Answer any three of the following questions)

11. Find the first and second derivatives of y at $x = 1$ from the following CO1- App (8)
 data

x	1	2	3	4
y	1	8	27	64

12. Using Taylor's series method find $y(1.1)$ given $y' = x + y$ with CO2- App (8)
 $y(1) = 0$
13. Solve $\frac{\partial^2 u}{\partial x^2} = 2 \frac{\partial u}{\partial t}$, $u(0,t) = 0$, $u(4,t) = 0$, $u(x,0) = x(4 - x)$. Take h CO3- Ana (8)
 $= 1$ and find the values of u up to $t = 5$ using Bender-Schmidt's difference equation
14. Verify the vectors $(1,2,0)$, $(2,3,0)$,(8,13,0) in \mathbb{R}^3 is a basis of \mathbb{R}^3 CO4- App (8)
15. Show that the following function defines an inner product on $V_2(\mathbb{R})$ CO5- U (8)
 where $x = (x_1, x_2)$ and $y = (y_1, y_2)$ and $\langle x, y \rangle = 6x_1y_1 + 7x_2y_2$