Code No.: **16109 N(H)**

VASAVI COLLEGE OF ENGINEERING *(Autonomous)*, HYDERABAD
B.E. (CBCS) VI-Semester Main Examinations, May-2019

Numerical Methods
(Open Elective-VI)

Time: **2 hours**   Max. Marks: **50**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** from **Part-B***

Q.No.	Stem of the question	M	L	CO	PO
	Part-A (5 × 2 = 10 Marks)				
1.	Define absolute error and Relative error.	2	1	1	1
2.	Develop a recurrence formula for finding $\sqrt{N}$	2	2	1	2
3.	Establish whether the system $1.01x + 2y = 2.01; x + 2y = 2$ Is well-conditioned or not.	2	3	2	1
4.	Discuss the working procedure of Gauss-Seidal method to solve the linear system of equations.	2	1	2	2
5.	State the intermediate value property.	2	1	1	1
	Part-B (5 × 8 = 40 Marks)				
6.a)	Round off the number 75462 to four significant digits and then calculate the absolute error and percentage error.	2	3	1	2
b)	Apply Bisection method to find a real root of the equation $\cos x = xe^x$	6	4	1	1
7.a)	Derive Newton-Raphson formula.	3	2	1	1
b)	Using Newton-Raphson method, find the real root of $x \log_{10} x = 1.2$ correct to four decimal places.	5	4	1	2
8.a)	Find the relative error if the number $X = 0.004997$ *is* i) Truncated to three decimal digits. ii) Rounded off to three decimal digits.	3	3	1	2
b)	Using Regula - Falsi method compute the real root of the equation correct to three decimal places $x^3 - 4x - 9 = 0$	5	4	1	2
9.a)	Explain the method of Gauss elimination to solve the linear system of equations.	3	2	2	1
b)	Apply Gauss elimination method to solve the equations $x + 4y - z = -5; x + y - 6z = -12; 3x - y - z = 4.$	5	3	2	2
10.a)	Define ill-conditioned and well-conditioned system of equations.	2	1	2	1
b)	Solve by Jacobi's iteration method, the equations $20x + y - 2z = 17; 3x + 20y - z = -18; 2x - 3y + 20z = 25.$	6	3	2	2

			M	L	CO	PO
11.a)	Write the difference between Direct method and iterative method to solve linear system of equations.		2	2	2	1
b)	Apply factorization method to solve the equations $3x + 2y + 7z = 4; 2x + 3y + z = 5; 3x + 4y + z = 7$.		6	3	2	2
12.a)	Define Inherent error, Rounding error and Truncation error.		3	1	1	1
b)	Solve the equations by using Gauss-Seidal iteration method $28x + 4y - z = 32; x + 3y + 10z = 24; 2x + 17y + 4z = 35$.		5	4	2	2

M: Marks; L: Bloom's Taxonomy Level; CO: Course Outcome; PO: Programme Outcome

S. No.	Criteria for questions	Percentage
1	Fundamental knowledge (Level-1 & 2)	32%
2	Knowledge on application and analysis (Level-3 & 4)	68%
3	*Critical thinking and ability to design (Level-5 & 6) (*wherever applicable)	

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