

Reg. No.:

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**SYED AMMAL ENGINEERING COLLEGE, RAMANATHAPURAM**  
**B.E. / B.Tech DEGREE PERIODICAL TEST - I, FEBRUARY 2013**  
**10177MA401/10144CSE21/MA2264 - NUMERICAL METHODS**  
**(Common to III IT, III CSE A, III CSE B, II EEE, II CIVIL)**

Regulation 2008/2010

Time: One and half hours

Date: 04.01.2013

Maximum: 50 marks

**Answer ALL questions**  
**PART A (5 X 2 = 10 marks)**

1. State fixed point theorem.
2. What is the order of convergence and convergence condition in Newton's Method?
3. Compare direct and indirect methods in solving system of equations.
4. What is the convergence condition in Gauss-Seidel method?
5. Differentiate Power method and Jacobi's method in finding the eigen values.

**PART-B (5X 16 = 80 marks)**

6. a. Find the smallest positive real root of the equation  $xe^{-2x} = \frac{1}{2} \sin x$  correct to three decimal places using Newton's method. (8)

OR

- b. Find the real root of  $x \log_{10} x - 1.2 = 0$  using iteration method. (8)

7. a. i. Solve  $10x + y + 2z = 12$ ;  $2x + 10y + z = 13$ ;  $x + y + 5z = 7$  by Gauss-Jordan method. (8)  
 ii. Solve  $x + y + 2z = 4$ ;  $3x + y - 3z = -4$ ;  $2x - 3y - 5z = -5$  using Gauss elimination method. (8)

OR

- b. i. Solve  $28x + 4y - z = 32$ ;  $x + 3y + 10z = 24$ ;  $2x + 17y + 4z = 35$  using Gauss-Seidel method. (8)

- ii. Find the inverse of the matrix  $\begin{bmatrix} 3 & 2 & 4 \\ 2 & 1 & 1 \\ 1 & 3 & 5 \end{bmatrix}$  using Jordan method. (8)

8. a. Find the largest and other eigen values of  $\begin{bmatrix} 1 & 1 & 2 \\ 0 & 1 & 3 \\ 1 & 1 & 1 \end{bmatrix}$  (16)

OR

- b. Find all eigen values and eigen vectors  $A = \begin{bmatrix} 2 & -1 & -1 \\ -1 & 2 & -1 \\ -1 & -1 & 2 \end{bmatrix}$  (16)