

Roll No

MVSE-202**M.E./M.Tech. II Semester**

Examination, May 2018

FEM in Structural Engineering*Time : Three Hours**Maximum Marks : 70**Note:* i) Answer any Five questions.

ii) All questions carry equal marks.

iii) Assume missing data suitably.

1. Explain finite element method. Give an example for its application and compare FEM method with other methods.
2. a) Outline step by step procedure for the determination of stress and deformations in a structure by FEM.
b) Discuss the following problems
 - i) Eigen value problems
 - ii) Propagation problems
3. a) Describe the Gaussian elimination approach for the solution of large system of simultaneous equations.
b) Discuss with formulae "Range kutta method".
4. What are the criteria in selecting interpolation polynomials? Explain convergence requirements in finite element formulation. Derive the shape function for a four noded plate bending element by lagrangian interpolating function.

5. Find the approximate deflection of a simply supported beam under a UDL using:
 - a) Rayleigh-Ritz method
 - b) Galerkin method
 - c) Finite difference method
 - d) FEM method
6. What is the use of Hermitian interpolation function? Derive shape functions for a 6-noded quadrilateral element.
7. Discuss static analysis and formulation of equilibrium equations for
 - a) Frames
 - b) Shells
8. Write short notes on any four of the following :
 - a) Static condensation
 - b) Convergence requirement
 - c) Jacobians method
 - d) Choleskians decomposition
 - e) Assembly of element matrices and vectors
 - f) In corporation of boundary conditions
