

Roll No.

23065-B/23125

M. Tech. 3rd Semester (Elective)

Examination – January, 2012

SIMULATION AND ANALYSIS

Paper : 953

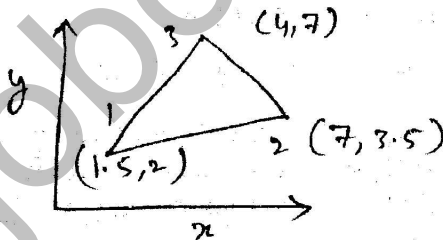
Time : Three hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions.

1. Evaluate the shape function N_1, N_2, N_3 at the interior point 'P' the triangular element as shown in fig. 20

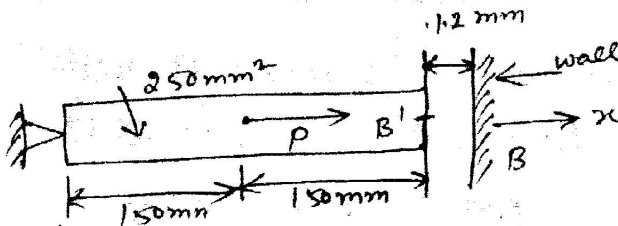


2. Describe the Mesh Generation, its approaches and how to refine the Mesh ? 20

3. In a bar shown in fig; a load $P = 60 \times 10^3 \text{ N}$ is applied as shown. Determine the displacement field, stress and support reaction in the bar.

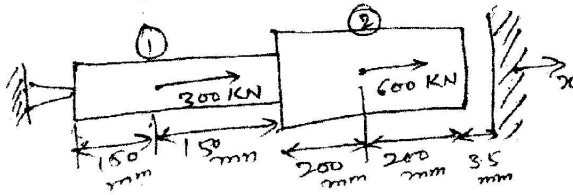
Take $E = 20 \times 10^3 \text{ N/mm}^2$

20



4. Explain finite element method in detail with its application, advantages and steps of execution of FEA. 20
5. (a) Differentiate b/w simulation and analysis. 10
 (b) Describe various applications of simulations. 10
6. Explain CFD with its various Engineering Applications. 20
7. Explain the following : 20
 (i) Rayleigh - Ritz method,
 (ii) Gauss - Legendre Quadrature.
8. A two step bar subjected to loading conditions as shown in figure. It is fixed at one end its free end is at a distance of 3.5 mm from the support. Determine : 20
 (i) The displacement of nodal points.
 (ii) Stresses in the elements.

(iii) The reactions at the supports.



$$A_1 = 250 \text{ mm}^2$$

$$A_2 = 400 \text{ mm}^2$$

$$E = 200 \times 10^3 \text{ N/mm}^2$$