Roll No. .....

23125

M. Tech. 3rd Semester (M.E.)
(Manufacturing & Automation)
Examination – December, 2014

SIMULATION & 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. What is simulation ? Explain the procedure for simulation in detail. 20

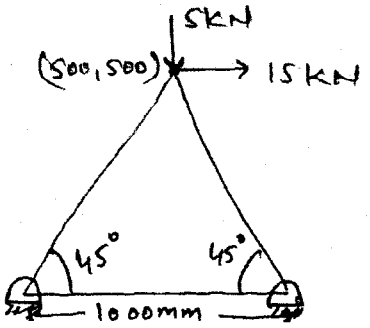
2. Consider three bar truss with pin joints as shown in Fig. 1. Area of cross section for all three elements is 350 mm^2. Treating each member as one dimensional linear element. Determine. 20

(a) Displacement at nodes

(b) Stressesin elements

(c) Reaction at the supports

Take E = 200 GPa



3. (a) Write down the procedure of FEM. 10

(b) What do you understand by mesh representation ? 10

4. What do you understand by aerodynamic design ? Explain the implementation of CFD in space application. 20

5. Determine the natural frequency of simply supported beam of length 1000 mm with cross sectional area of 80 cm × 25 cm. 20

Take E = 200 GPa

$f = 7850\ kg/m^3$

6. Derive the Bernoulli's equation. Also explain assumption for it. 20

7. (a) Explain upwind discretization applied to FEM. 10

   (b) What are the advantages of CFD ? 10

8. Write short notes on : 20

   (a) FDM

   (b) Shape function

   (c) Continuity equation

   (d) Equation of motion