

Roll No.

23125

**M. Tech 3rd Semester (ME)
(Manufacturing & Automation)
Examination – May, 2018**

Simulation and Analysis

Paper : 953

Time : Three Hours]

[Maximum Marks : 100

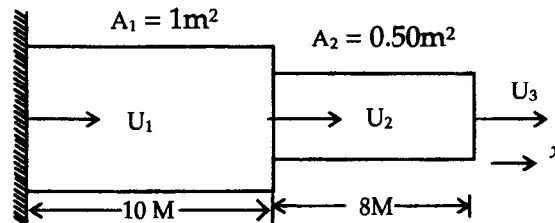
Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions in total.

1. Evaluate the integral by two point Gaussian quadrature

$$I = \int_{-1}^1 \int_{-1}^1 (2x^2 + 3xy + 4y^2) dx dy \quad \text{Gauss points are } +0.57735 \text{ and } -0.57735 \text{ each of weight } 1.00 \quad 20$$

2. Determine the Eigen value for stepped bar as shown below : 20



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3. Explain various methods of solving boundary value problems in FEA. 20
 4. Write the short note on : 10, 10
 - (a) Plane stress Analysis
 - (b) Strain Displacement Matrix.
 5. Write short note on mesh refinement and adaptive mesh in CFD modelling. 20
 6. Derive the equation for convective flux per unit mass and the diffusive conductance at U control volume faces using staggered grid. 20
 7. Discuss the role of SIMPLE and its variants in numerical analysis. 20
 8. What is boundary layer? What is flow separation and what are the reasons for the separation. Explain the position of flow separation using suitable example. 20
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