Total No. of Questions : 7]

SEAT No. :

P3911

[Total No. of Pages : 2

[5155]-161
M.E. (Mech.-Design)
FINITE ELEMENT METHOD
(2013 Course) (Semester - II)

Time : 3 Hours] *[Max. Marks : 50*

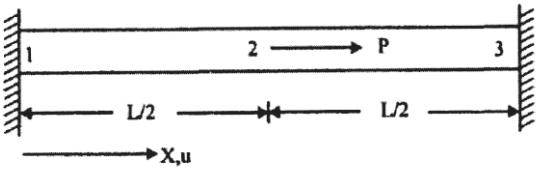
Instructions to the candidates:

1) ***Answer any Five questions.***
2) ***Figures to the right indicate full marks.***
3) ***Use of electronic pocket calculator is allowed.***
4) ***Assume suitable data, if required.***

Q1) Write a note on Panelty and Elimination Approach for Solution of FEA equations. **[10]**

Q2) Calculate the displacement at node 2 of a fixed beam shown in Fig. Subjected to an axial load 'P' at node 2 **[10]**

Q3) Determine the nodal displacements and element stresses by finite element formulation for the following figure. Use P - 300 k N; A, = 0.5 m2; A2 = 1 m2; E = 200 GPa. Use RAYLEIGH - RITZ METHOD. **[10]**



Q4) Explain convergence requirements in Finite Element formulations and also write anote on Newtons Cotese Formula. **[10]**

Q5) Write a note on following (Any Two) **[10]**

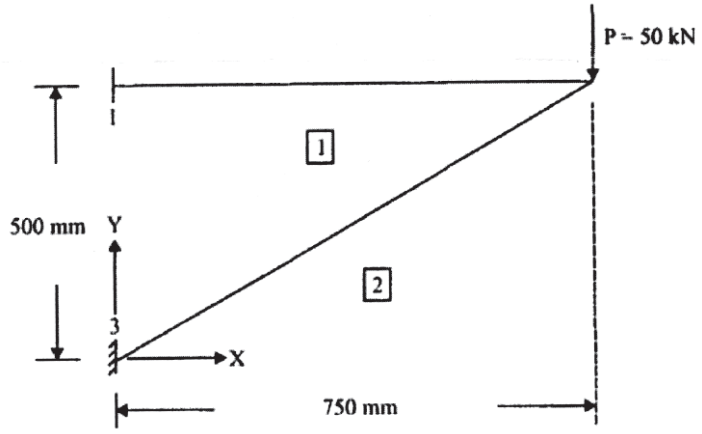
a) Kirchoffs Plate Bending theory.

b) Mindlin Plate Element.

c) Degenerated Shell Element.

P.T.O.

Q6) Determine the stiffness matrix, stresses and reactions in the truss structures shown below, assuming points 1 and 3 are fixed. Use E = 200 GPa and A = 1000 mm2. **[10]**



Q7) Write a Note (any Four) **[10]**

a) NR method for Nonlinear FEA.

b) Consistent and Lumped Mass Matrices.

c) Mode Superposition Scheme.

d) Submodelling and substructuing.

e) h & P refinements.