Subject Code: H2103/R13

M. Tech –II Semester Regular Examinations, September, 2014

FINITE ELEMENT METHOD

(Common to TE, MD, ME, CAD/CAM and AMS)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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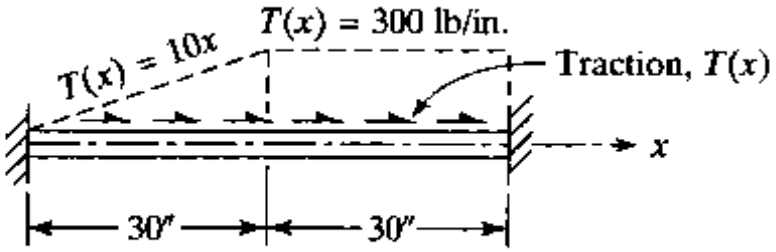
1. A steel rod is attached to rigid walls at each end and is subjected to a distributed load T(x) as shown in figure.



$E = 30 \times 10^6$ psi $A = 2$ in.^{2}

(a) Write the expression for the potential energy .

(b) Determine the displacement u(x) using the Rayleigh Ritz method. Assume a displacement field $u(x) = a_0+a_1x+a_2x^2$. Plot u verses x.

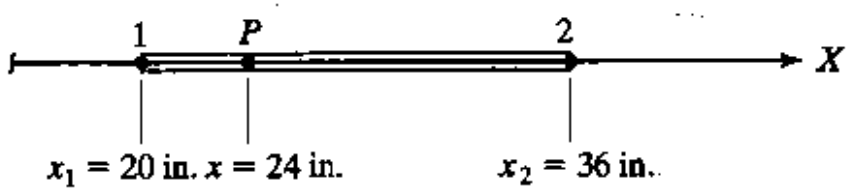
(c) Plot σ versus x

2. (a) Write the comparison of Finite element method with other methods.

(b) Evaluate the following:

(i) Evaluate ξ, N_1 and N_2 at the point P.

(ii) If q_1=0.003 in and q_2=-0.005 in, determine the value of the displacement q at point P.



3. (a) Write the properties of element stiffness matrix.

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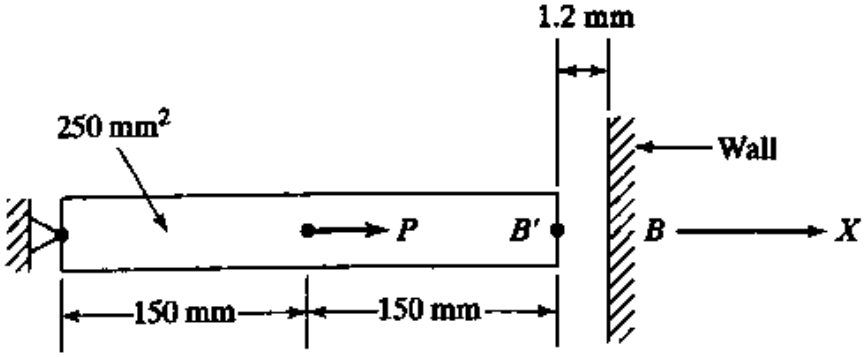
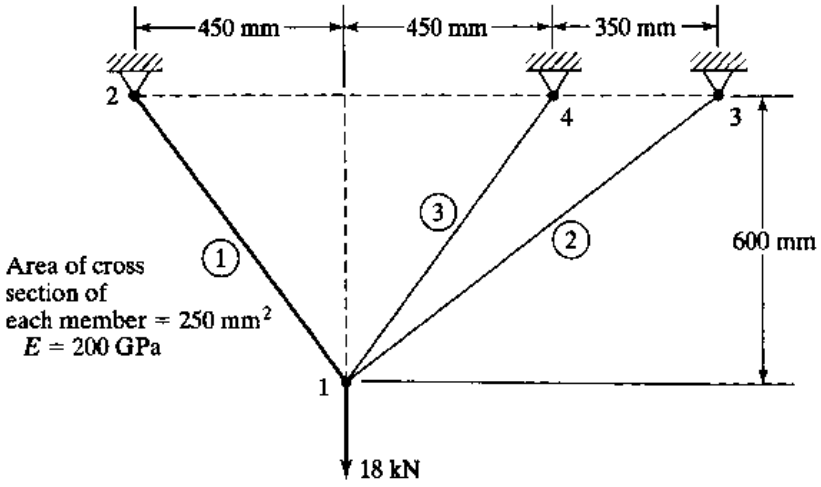
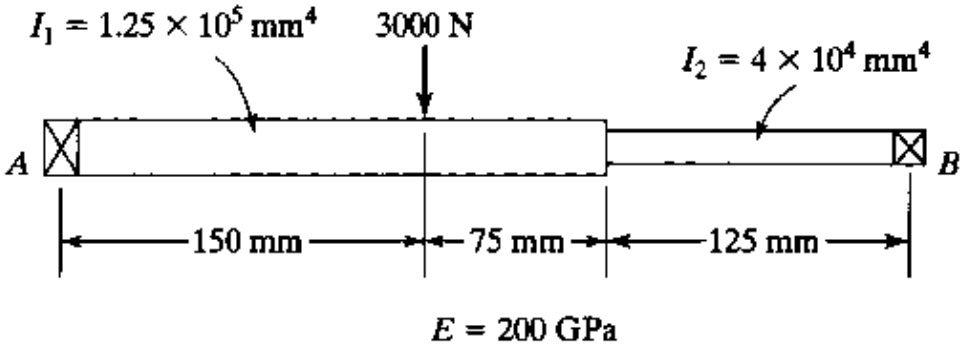
(b) In figure, a load P=60×10^3 N is applied as shown. Determine the displacement field, stress and support reactions in the body. Take E=20×10^3 N/mm^2.



4. For the three bar truss shown in figure, determine the displacements of node 1 and the stress in element 3.



5. (a) Explain Hermite shape functions in detail.
   (b) Find the deflection at the load and the slopes at the ends for the steel shaft shown in figure. Consider the shaft to be simply supported at bearings A and B.



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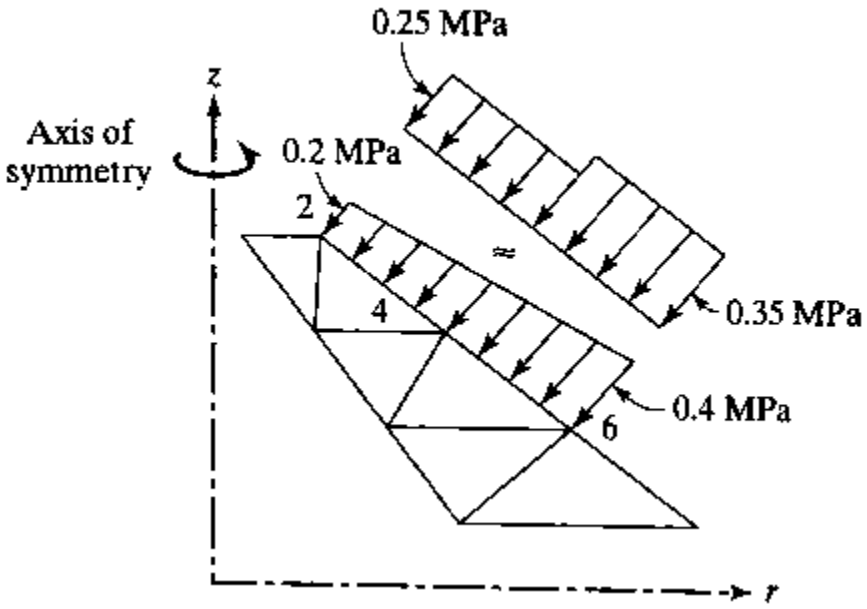
6. (a) An Axisymmetric body with a linearly distributed load on the conical surface is shown in figure. Determine the equivalent point loads at nodes 2, 4 and 6.



(b)Write a short note on Constant strain triangle (CST).

7. Write a short note on the following:
   (a) Patch test
   (b) Sub parametric elements
   (c) H-refinement

8. Explain the Eigen value evaluation methods in detail.

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Subject Code: H4502/R13

M. Tech –II Semester Regular Examinations, September, 2014

IMAGE AND VIDEO PROCESSING

(Com to SSP, DIP, CE&SP, IP,C&SP, SP&C, DECS, E&CE, DECE and CS)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. Explain about any 2 transforms and also write its importance.

2. a) What is image restoration? Give classification for image restoration and also explain them.
   b) Explain about Blind deconvolution.

3. a) Explain any 2 techniques for sharpening an image.
   b) Discuss about Histogram processing.

4. a) What is Hough Transform? Explain with equations.
   b) Explain about different clustering algorithms.

5. a) What is the need of compression?
   b) Explain about different image compression techniques.

6. a) Discuss about Photometric Image Formation model.
   b) What is sampling? Explain about the sampling procedure in Video signals.

7. a) Differentiate between Pixel Based motion estimation and Mesh based motion estimation.
   b) Discuss about predictive coding.

8. Explain about the following terms
   a) KL Transform
   b) Shannon – Fano coding
   c) JPEG Standards

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Subject Code: H5804/R13

M. Tech –II Semester Regular Examinations, September, 2014

OBJECT ORIENTED ANALYSIS AND DESIGN

(Computer Science & Engineering)

Time: 3 Hours **Max Marks: 60**

Answer any FIVE questions

All questions carry EQUAL marks

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1. Explain the Object Oriented concepts and need for Object Oriented modeling?

2. Explain the concepts of classes and explain how to add responsibilities to classes?

3. Explain polymorphism and iterated messages in the case of collaboration diagrams?

4. Explain the terms use case ,actor and draw an use case diagram for representing sa banking system?

5. What are the common modeling techniques for Component diagrams?

6. a) Define UML and explain how the architecture of UML meets the requirements of modeling?
   b) What are nodes, components and explain the use of component & deployment diagrams in UML?

7. a) How to model distribution of responsibilities of a system?
   b) What is an event and explain the type of events with examples?

8. a) What are similarities and differences between sequence and collaboration diagrams?
   b) How do you represent advanced relationships, types and interfaces?

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