AR13 **Set-01**

Code No: 13MTE1013

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular Examinations, July-2014
FINITE ELEMENT ANALYSIS
(THERMAL ENGINEERING)

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

Answer any FIVE Questions
ALL questions carry equal marks

1. A tapered rod is subjected to a body force $f=x^2$ acting in the x- direction and also a point load P=2 N as shown in Figure P.1.Use the Raleigh-Ritz method with an assumed displacement field $u=a+bx+cx^2$ to determine the expressions for displacement u(x) and stress σ (x)

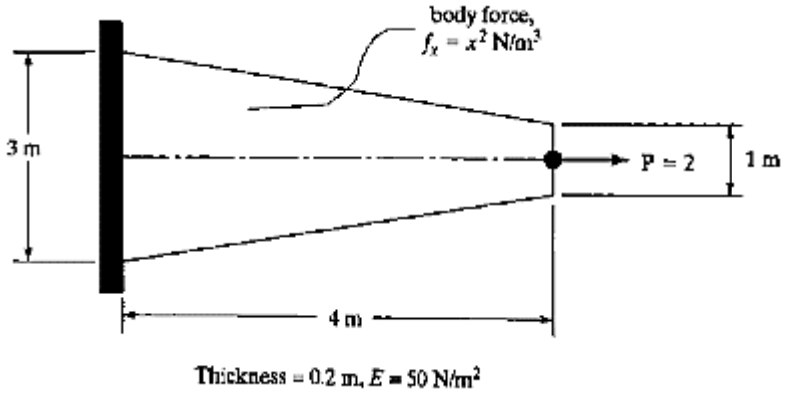

Figure P.1

2. The structure in Figure P.2, is subjected to an increase in temperature, $\Delta T = 80^0$C. Determine the displacements, stresses and support reactions.

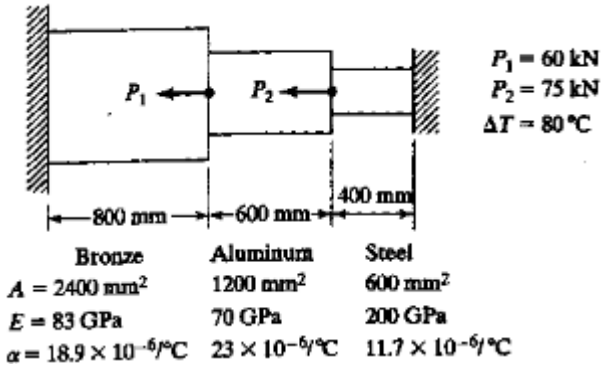

Figure P.2

3. a. List and briefly describe the general steps of the finite element method.
   b. Discuss the merits and demerits of FEM over other methods

4. Explain the following methods for treatment of boundary conditions in FEM
   a. Elimination approach
   b. Penalty approach.

5. Define and derive the Hermite shape functions for a two nodded beam element?

6. Calculate displacements and stress in a triangular plate shown in Figure P.6, fixed along one edge and subjected to concentrated loads at its free end. Assume E= 70,000 MPa, t = 10 mm and μ = 0.3

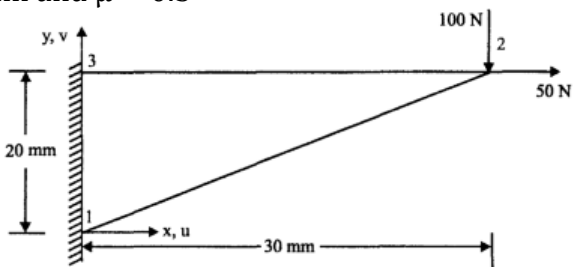

Figure P.6

7. Consider the circular heat transfer pin shown in Figure P.7. The base of the pin is held at constant temperature of 100◦C. The tip of the pin and its lateral surfaces undergo convection to a fluid at ambient temperature Ta. The convection coefficients for tip and lateral surfaces are equal. Given k=380 W/m◦C, L = 8 cm, h = 2500 W/m2◦C, d = 2 cm, Ta = 30◦C. Use a two element finite element model with linear interpolation functions (i.e., a two-nod element) to determine the nodal temperatures and the heat removal rate from the pin .Assume no internal heat generation.

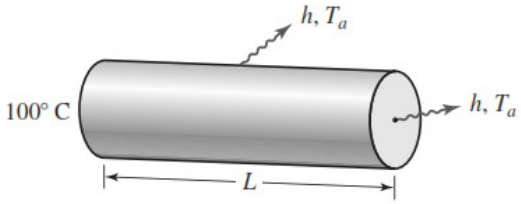

Figure P.7

8. Determine the Eigen values for a stepped bar in axial vibrations shown in Figure P.8 E=200GPa and ρ=7800Kg/m^3.

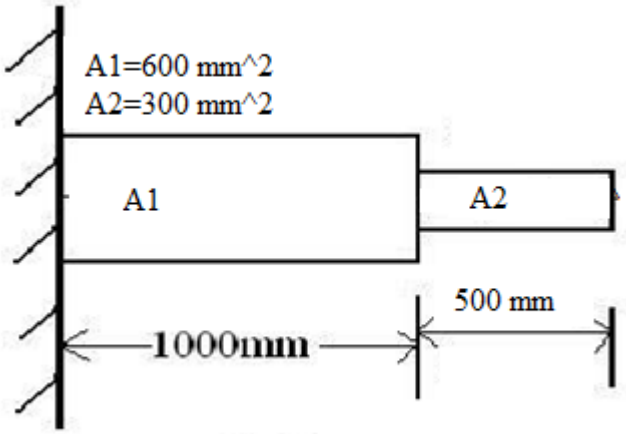

Figure P.8

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AR13 **Set-02**

Code No: 13MDE1005

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT,TEKKALI
(AUTONMOMOUS)
I M.Tech II Semester Regular Examinations, July-2014
OPTICAL COMMUNICATION
(Digital Electronics and Communication Systems)

Time: 3 hours **Max Marks: 60**

Answer Any FIVE questions
All questions carry equal mark

1. a) What are the advantages of the optical fibre communication (8M)
   b) A typical relative refractive index difference for an optical fiber designed for long distance transmission is 1%.Estimate the numerical aperture for the fiber when the core index is 1.47. (4M)

2. a) An LED has radiative and nonradiative recombination times of 30 and 100 ns respectively. Determine the internal quantum Efficiency (4M)
   b) Compare the performance of APD and PIN diode. (8M)

3. a) Compare LED and LASER. (6M)
   b) Explain population inversion? (6M)

4. a) Discuss various kinds of losses that an optical signal might suffer while propagating through fiber, Which is most important one? What is the effect of these losses on light power and pulse shape? (6M)
   b) Discuss material and waveguide dispersion mechanisms with necessary mathematical expressions (6M)

5. a) Derive internal quantum efficiency of LIGHT EMITTING DIODE (6M)
   b) Explain how the optical radiations are generated from fabry perot resonator cavity laser with neat schematics. (6M)

6. a) Discuss briefly about various sources of noise in a PIN diode based fiber optic receiver. (6M)
   b) Discuss the method of implementation of wavelength division multiplexing in full duplex optical communication links. (6M)

7. a) Differentiate between intermodal and intramodal dispersion (7M)
   b) Explain SONET (5M)

8. a) Describe optical switches (6M)
   b) Explain transreceivers (6M)

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AR13 **Set-02**

Code No: 13MIT1009

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)

I M.Tech. II Semester Regular Examinations, July – 2014

MACHINE LEARNING
(INFORMATION TECHNOLOGY)

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

Answer any Five Questions
All Questions carry equal marks

01. Illustrate the basic design issues and approaches to machine learning. (12M)

02. (a) By Considering a suitable example, illustrate the working of ID3 algorithm. (6M)
    (b) Write in detail about perceptrons. (6M)

03. (a) Mention and explain any two alternative error functions that can be used in neural network training. (4M)
    (b) Explain in detail how to compare two learning methods. (8M)

04. (a) Consider Medical Diagnosis problem and illustrate Bayes rule. (6M)
    (b) With the aid of an example, describe the working of naïve Bayesian classifier. (6M)

05. In the connection of mistake bound model of learning, briefly explain the following:
    (a) Mistake Bound for the FIND-S Algorithm (3M)
    (b) Mistake Bound for the HALVING Algorithm (3M)
    (c) Optimal Mistake Bounds (3M)
    (d) Weighted-Majority algorithm (3M)

06. (a) What is a Radial Basis Function network? Explain its concept. (6M)
    (b) Write and explain the steps of A prototypical genetic algorithm. (6M)

07. Explain in detail about sequential covering algorithms. (12M)

08. (a) What is EBL? Explain its concept. (6M)
    (b) Write KBANN algorithm and illustrate its operation. (6M)

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AR13 **Set-01**

Code No: 13MPE1011

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech. II Semester Regular Examinations, July – 2014

FLEXIBLE AC TRANSMISSION SYSTEMS
(Power Electronics and Electric Drives)

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

Answer any FIVE questions
All questions carry EQUAL marks

1. a) Explain the mechanism of power flow in parallel paths with the help of one line diagram. [6M]
   b) Explain the factors that limit loading capability of transmission lines. [6M]

2. Differentiate between SVC and STATCOM with respect to the following
   a) V-I and V-Q characteristics. b) Transient stability. c) Response time. [4M+4M+4M]

3. a) Explain the operation and control of Thyristor Controlled Reactor. [6M]
   b) Explain the operation of Thyristor Switched Capacitor. [6M]

4. a) Explain how transient stability is improved by series compensation. [6M]
   b) Write a brief note on variable impedance type series compensators. [6M]

5. Explain about thyristor controlled series capacitor(TCSC) [12M]

6. Explain about GTO thyristor controlled series capacitor(GCSC) [12M]

7. Explain operation of thyristor tap changers. [12M]

8. Explain about the real and reactive power flow control by using phase angle regulator. [12M]

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AR13 **Set-01**

CODE: 13MVL1011

ADITY INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech II Semester Regular Examinations, July-2014

LOW POWER VLSI DESIGN
(VLSI System Design)

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

Answer any five questions
All questions carry equal marks

1.	a) Explain about the limitations of low power, low voltage design.	6M
	b) Write about Bi-CMOS Manufacturing and Integration Considerations	6M
2.	a) Elaborate on advanced isolation techniques	6M
	b) Explain about Low-Capacitance Bipolar/BiCMOS Processes	6M
3.	a) Is it important to have Low-Voltage/Low-Power SOI CMOS? Justify.	6M
	b) Compare CMOS and Bi polar technologies	6M
4.	Explain about any three Bipolar SPICE Models	12M
5.	a) State the static and dynamic characteristics of MOSFET	6M
	b) Give the Limitations of MOS Device Characteristics	6M
6.	a) Explain about Surface p-Channel for Sub-Half-Micron Devices	6M
	b) Give the Performance Evaluation and Comparison of BiCMOS and CMOS circuits	6M
7.	a) Elaborate on Conventional BiCMOS Logic Gate	6M
	b) Explain about ESD free Bi-CMOS	6M
8.	a) Explain about The Pipelining Theme for Flip Flops	6M
	b) What are the Quality Measures for Latches and Flip-Flops?	6M

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AR13 **Set-01**

CODE: 13MCS1009

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
I M.Tech, II Semester Regular Examinations, July-2014
OBJECT ORIENTED ANALYSIS AND DESIGN
(Computer Science and Engineering)

Time: 3 hours **Max.Marks:60**

Answer Any FIVE questions
All questions carry equal mark

1. (a) What do you mean by the term USDP? Explain the various phases of USDP in OOAD. [6M]
   (b) What are the building blocks of UML? Explain [6M]

2. (a) Describe briefly about Domain modeling. [6M]
   (b) Differentiate between Model and a Diagram. [6M]

3. (a) What do you mean by Structural modeling? Explain [6M]
   (b) Give the Use Case Model for the Library Management System (LMS) using include and extend stereo types. [6M]

4. Explain the following with an example. [12M]
   (i) Conceptual Class diagram (ii) Activity diagram

5. With a suitable example explain how to design a class. Give all the possible representation in a class (name, attributes, visibility, methods and responsibilities) [12M]

6. Explain in detail about Interaction diagrams by considering a Bank ATM system as an example. [12M]

7. Explain the State Chart diagram for a Real-Time system with a suitable example. Also define each component and its use. [12M]

8. Write a short note on the following:
   (i) Aggregation (ii) Generalization (iii) Cohesion and Coupling
   (iv) Design Patterns [4x 3M=12M]

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