AR13

CODE: 13CE4031 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech II Semester Supplementary Examinations, June-2019

FINITE ELEMENT METHODS

(Civil Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What is meant by discretization?
   b) What do you mean by plane strain condition?
   c) What are the various shape functions used in FEM?
   d) Distinguish between local co-ordinates and global co-ordinates system.
   e) What is plane stress?
   f) What is meant by nodal load matrix?
   g) Write the Jacobian for 3-noded triangular element.
   h) Write the applications of FEM.
   i) Write the stiffness matrix for 1D bar element?
   j) Give two examples for axisymmetric elements.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

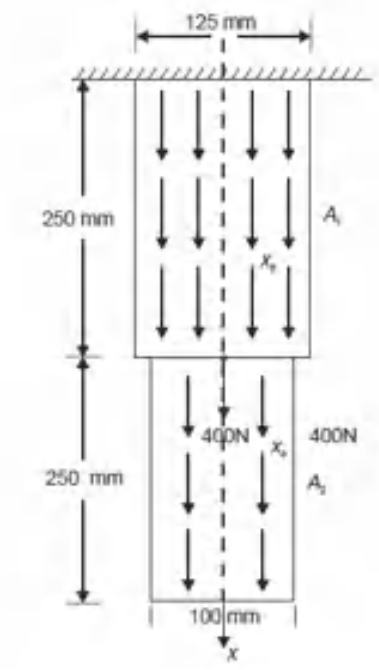
2. a) Explain the concept of FEM briefly and outline the procedure. 6M
   b) Discuss the merits and demerits of FEM 6M

(OR)

3. a) State and explain the principle of minimum potential energy. 6M
   b) Explain the term Axi-Symmetric problems and give constitutive law for such problems. 6M

UNIT-II

4. The thin plate of uniform thickness 25 mm, is as shown in Fig. In addition to the self-weight, the plate is subjected to a point load of 400 N at mid-depth. The Young's modulus $E = 2 \times 10^5$ N/mm^2 and unit weight $\rho = 0.8 \times 10^{-4}$ N/mm^2. Analyse the plate after modelling it with two elements and find the stresses in each element. Determine the support reactions also. 12M



(OR)

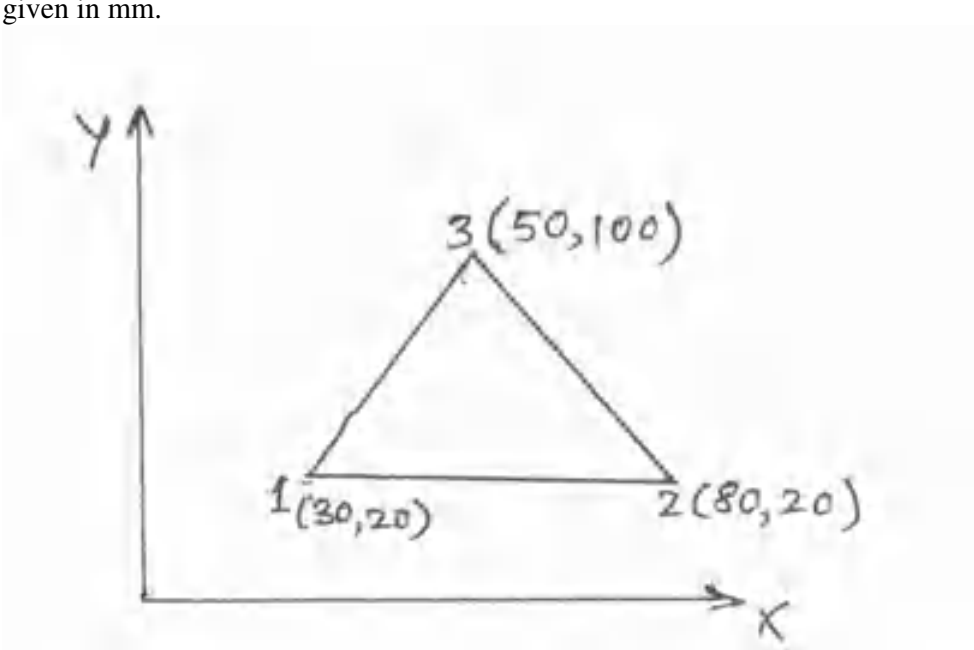
5. a) Explain about different types of elements in plane stress and plane strain analysis 6M
   b) Explain the term 'geometric isotropy / geometric Invariance'. Why polynomial shape functions should satisfy these requirement? How do you check a polynomial for this requirement? 6M

UNIT-III

6. Derive the stiffness matrix for a 4 noded rectangular element 12M

(OR)

7. For the plane stress element shown in Fig. evaluate the stiffness matrix. Assume E=210GPa, Poissons ratio=0.25 and element thickness 't'=10mm. The coordinates are given in mm. 12M



UNIT-IV

8. a) Explain the terms isoparametric, sub parametric and super parametric elements. 6M
   b) Write short notes on serendipity elements. 6M

(OR)

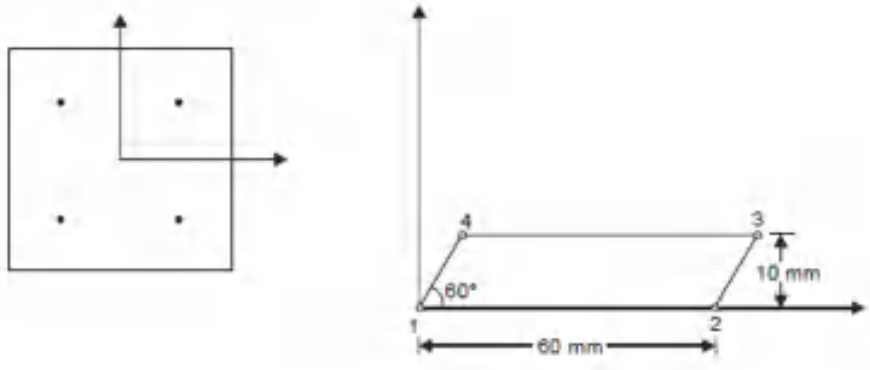
9. Derive the shape functions for a four-noded and eight-noded quadrilateral 2D membrane element. 12M

UNIT-V

10. Explain in detail about the formulation of 4-node iso-parametric axi-symmetric element. 12M

(OR)

11. Assemble Jacobian matrix and strain displacement matrix corresponding to the Gauss point (0.57735, 0.57735) for the element shown in Fig. Then indicate how you proceed to assemble element stiffness matrix. 12M



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AR13

CODE: 13EE4029 SET-2

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI

(AUTONOMOUS)

IV B.Tech. II Semester Supplementary Examinations, June-2019

UTILIZATION OF ELECTRICAL ENERGY

(Electrical and Electronics Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Write any two advantages of electric drive over other drives.
   b) List out types of electric drives.
   c) List out modes of transfer of heat.
   d) List the types of electric heating methods.
   e) Write any two drawbacks of metal filament lamps.
   f) Define Mean spherical Candlepower.
   g) Why a series motor is preferred for the electric traction.
   h) Write any two advantages of electric braking over mechanical braking
   i) Define percentage gradient in railways.
   j) Define Adhesive weight.

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Classify various types of loads. Give examples of loads which are a function of speed. 6M
   b) Describe various industrial applications of electric drives. 6M

(OR)

3. a) Derive an expression for temperature rise of an electrical machine. State the assumptions made. 6M
   b) Discuss various factors which affect the selection of motor for a particular drive. 6M

UNIT-II

4. a) Describe the requirements of a good heating material. 4M
   b) What is dielectric heating? How is this different from induction heating? Explain the factors on which dielectric loss in a dielectric material depend. 8M

(OR)

5. a) Discuss the principle of arc welding and the difference between carbon and metallic arc welding and their relative merits. 8M
   b) Explain the principle of spot welding. 4M

UNIT-III

6. a) Derive an expression for illumination at a point due to a perfectly diffusing a circular disc of radius R. 8M
   b) Write the comparison between tungsten filament lamps and fluorescent tubes? 4M

(OR)

7. a) Describe the construction and principle of operation of filament lamp. 6M
   b) A building measuring 30 m x 20 m is to be floodlight on the front side with brightness of 25 lumen/sq. metre. Co-efficient of reflection of building surface is 0.25. Lamps of 500 W having lumens output of 8000 each are used. Assuming beam factor as 0.6, waste light factor 1.2 and maintenance factor as 0.75, determine the number of lamps required. 6M

UNIT-IV

8. a) Describe the important requirements of the driving equipment used of traction purposes. 6M
   b) Explain different periods in speed-time curve for train movement. 6M

(OR)

9. a) From the simplified speed- time curve, determine the maximum speed, when the actual time of run, values of acceleration, retardation and the distance between stops are given. 6M
   b) A train has schedule speed of 30 Kmph over a level track, distance between stations being 1 Km. Station stopping time is 20 seconds. Assuming braking retardation of 3 kmphps and maximum speed 25 per cent greater than average speed, calculate acceleration required to run the service. 6M

UNIT-V

10. a) Explain the terms 6M
    i)Adhesive weight ii)Train resistance iii)Speed time curve
    b) Derive the expression for power output from the driving Axles. 6M

(OR)

11. An electric train weighing 400 tons runs along an up gradient of 1% with following speed-time curve: 12M
    i) Uniform acceleration of 1.5 Kmphps for 30 sec.
    ii) Free-running for 36 secs.
    iii) Coasting for 25 secs.
    iv) Braking at 2.6 Kmphps to rest.

    If tractive resistance is 45 N/Tons, rotational inertia effect 10%, overall efficiency of transmission and motor 75%, determine the specific energy consumption.

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AR13

CODE: 13ME4033 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech. II Semester Supplementary Examinations, June-2019
PRODUCTION PLANNING & CONTROL
(Mechanical Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) What are the phases of ppc?
   b) Deference between qualitative and quantitative forecasting techniques
   c) What is capacity planning
   d) Basis for master production schedule
   e) MRP II
   f) What is no passing rule in a sequencing algorithm
   g) Define tardiness
   h) What are the various costs associated with inventory
   i) What is bill of material?
   j) Levels of dispatching

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) What are the major objectives of PPC **6M**
   b) What are various types of production systems? Explain briefly **6M**

(OR)

3. a) Explain the quantitative techniques used in forecasting **8M**
   b) A nursing home has one year moving average forecasting method to product a particular medicine requirements. The actual demand for the item is shown in the table below: **4M**

Month	1	2	3	4	5	6	7	8	9	10	11	12
demand	90	80	65	70	100	85	60	75	90	85	60	75

Use the 12 month moving average; find the exponential smoothing forecast for the 13th month.

UNIT-II

4. a) Explain briefly the aggregate planning strategies **7M**
   b) Write about the factors influencing the effective capacity **5M**

(OR)

5. a) Explain the sequence of steps required to balance an assembly line **6M**
   b) What is MPS? How is it prepared? **6M**

AR13

CODE: 13ME4033 **SET-2**

UNIT-III

6.	a)	Explain the functions of inventories.	**4M**
	b)	An annual requirement for a particular raw material is 8000 units costing Rs.1 each for its manufacture, the ordering cost is Rs.12.5 and carrying cost is 20% of average inventory planning. Find the Economic order Quantity and Total cost for the year, Number of orders required and How frequently should the orders to be placed?	**8M**
		(OR)	
7.	a)	What is MRP? Explain the flow of information in MRP.	**6M**
	b)	Write about types of KANBAN System	**6M**

UNIT-IV

8.	a)	Explain the procedure by which scheduling 2 jobs in m machines can be done	**6M**
	b)	Write about line of balance technique.	**6M**
		(OR)	
9.	a)	What are Characteristics of flow shop scheduling	**5M**
	b)	List out various scheduling rules. Explain at least three of them.	**7M**

UNIT-V

10.	a)	Discuss in detail the procedure of routing.	**6M**
	b)	What is the role of bill of material in preparing the route sheets	**6M**
		(OR)	
11.	a)	What is follow up? Explain its significance in production?	**6M**
	b)	What is meant by dispatching in manufacturing? Explain its functions in detail.	**6M**

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AR13

CODE: 13EC4036 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2019
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics & Communication Engineering)

Time: 3 Hours **Max Marks: 70**

PART-A

ANSWER ALL QUESTIONS **[1 x 10 = 10 M]**

1. a) Mention the types of Interference reduction factors.
   b) Illustrate the importance of frequency reuse concept in cellular and mobile communications.
   c) List the various types of non co-channel interference.
   d) What is intersystem handoff?
   e) Define co-channel interference.
   f) What are large scale propagation models?
   g) Draw the frequency characteristics of frequency selective fading.
   h) What is the minimum separation of cell site antennas?
   i) Give the significant features of slotted ALOHA.
   j) Why VLR is required in network and switching subsystem?

PART-B

Answer one question from each unit **[5x12=60M]**

UNIT-I

2. a) Why cell splitting and explain the concept of cell splitting. **6 M**
   b) Describe the performance criteria of mobile communication systems. **6 M**

(OR)

3. a) Describe the principle of operation of cellular mobile system and explain the cellular concept with a neat diagram. **6 M**
   b) List the types of interference reduction factors and explain them briefly. **6 M**

UNIT-II

4. a) Differentiate between large scale and small scale propagation models. **6 M**
   b) What is co-channel interference? How it can be reduced? **6 M**

(OR)

5. a) Illustrate the propagation mechanism over water or flat open area. **8 M**
   b) What is small – scale fading? Write the factors influencing fading. **4 M**

UNIT-III

6.	a)	Explain in detail about directional antennas used for interference reduction.	**6 M**
	b)	What is meant by a dropped call? Explain the factors that influence the dropped call rate.	**6 M**
		(OR)	
7.	a)	Illustrate how umbrella pattern antennas are used as the cell site antennas.	**6 M**
	b)	Explain the difference between soft handoff and hard handoff.	**6 M**

UNIT-IV

8.	a)	Describe the grouping of the voice, setup, and paging channels.	**8 M**
	b)	List and discuss the types of channel assignment.	**4 M**
		(OR)	
9.	a)	Discuss the role of Channel sharing and borrowing in cellular and mobile systems.	**6 M**
	b)	Write about fixed channel assignment schemes in detail.	**6 M**

UNIT-V

10.	a)	Explain in detail about GSM architecture.	**6 M**
	b)	Explain the principle of CDMA with necessary diagrams.	**6 M**
		(OR)	
11.	a)	Describe the features of pure ALOHA in detail.	**6 M**
	b)	Write short notes on, i) TDMA structure ii) Frame length iii) Frame offset	**6 M**

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