AR13

CODE: 13CE4031 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2017

Finite Element Methods
(Civil Engineering)

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

PART-A

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

1. a) How do you express the size of Global Stiffness Matrix?
   b) State Saint Venant's Principle?
   c) Express the shape functions of a bar element in Natural coordinates?
   d) List any two properties of Global Stiffness Matrix.
   e) Express the displacement vector for a Plane truss element?
   f) For a bar element$_{1\text{-}2}$, if q_1= 0.03mm, q_2= -0.005mm, ξ = -0.05. Find shape functions N_1 and N_2
   g) Distinguish schematically between Global, Relative, and Natural coordinates?
   h) Write the expression for the two point Gaussian Quadrature formula for 1D-Analysis?
   i) What is Convergency?
   j) Express the displacement vector for a 1-D beam element?

PART-B

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

UNIT-I

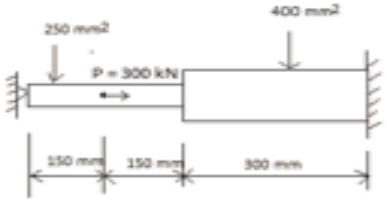
2. a) Explain briefly about the Raleigh-Ritz Method?
   b) Analyze the basic steps involved in finite element analysis and explain them briefly with reference to static structural problems with example.

(OR)

3. a) Explain the Boundary conditions in case of a three dimensional stress system?
   b) In a solid body, the six components of the stress at a point are given by σ_x = 40 M Pa, σ_y = 20 M Pa, σ_z = 30 M Pa, τ_{yz} = -30 MPa, τ_{xz} = 15 MPa and τ_{xy} = 10 MPa. Determine the normal stress at the point, on a plane for which the normal is (n_x, n_y, n_z) = (1/2 , 1/2, 1/$\sqrt{2}$).

UNIT-II

4. a) Derive Element Stiffness matrix [$K^{(e)}$] of a Bar element using Potential energy approach.
   b) Determine the displacement vector, strains, stresses and reactions the axially loaded stepped bar as shown in the figure. Take E=200 GPa



(OR)

5. a) Express the nodal load vector for a beam element subjected to uniformly distributed load (UDL)?
   b) Analyze the deflection and slope at the end of the cantilever beam subjected to point load at free end.

UNIT-III

6. a) Establish the shape functions for three nodded Triangular element?
   b) The nodal coordinates of the triangular element are shown in Figure: 2. At the interior Point P, the X co-ordinate is 2.8 and N_1 =0.4. Find N_2, N_3 and the Y coordinate at Point P.

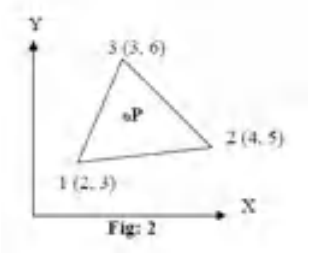
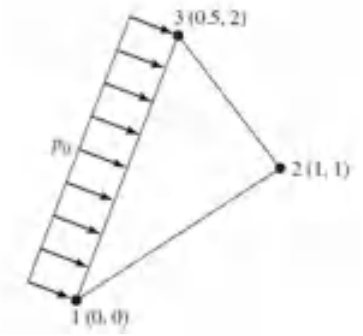


Fig: 2

(OR)

7. a) Derive the consistent load vector in a CST element due to traction on one edge.
   b) The constant strain triangular element shown in Figure is subjected to a uniformly distributed pressure as shown. Determine the equivalent nodal forces.



UNIT-IV

8. a) Explain the terms isoparametric, subparametric and superparametric elements.
   b) Establish the shape functions for six nodded Triangular element?

(OR)

9. a) Explain the isoparametric elements and their advantages.
   b) Describe the procedure of obtaining stiffness matrix of an axisymmetric triangular element using potential energy approach?

UNIT-V

10. a) State and explain the constitutive law for a 'Axi-symmetric' problems?
    b) Describe the procedure of obtaining stiffness matrix of an axisymmetric triangular element using potential energy approach?

(OR)

11. a) Write the expression for two point Gaussian Quadrature formula for 1D-Analysis?
    b) Analyze the following integral equation using two point Gaussian Quadrature formula and compare with exact solution. Given for 2 x 2 rule,

$\xi_i = \pm 0.57735, w_i = 1.0$

$$\int_{-1}^{1}\int_{-1}^{1}(\xi^4 + \eta^3 + \xi^2\eta + \eta\xi^2)\, d\eta\, d\xi$$

AR13

CODE: 13EE4029 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2017
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) What is energy star rating of electrical equipment?
   b) Define dielectric heating.
   c) Define lamp efficiency
   d) List any two special features of traction motor.
   e) Define adhesive weight.
   f) Define load equalization.
   g) List out different methods of electric welding.
   h) Define solid angle.
   i) Draw the trapezoidal speed-time curve for a locomotive.
   j) Define tractive effort.

PART-B

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

UNIT-I

2. a) Discuss the advantages and disadvantages of electric drive over other drives. **6 M**
   b) A 25H.P motor has a heating constant of 90 minutes. When run continuously on full load, it attains a final steady temperature of 45^0C.Calculate the temperature of the motor after 30 minutes, if its initial temperature is 10^0C. **6 M**

(OR)

3. a) What do you mean by demand side management? What are its advantages? **6 M**
   b) A motor running continuously on full load has a temperature rise of 40^0C. The heating time constant is 120 minutes. How long should it run at twice the continuously rated output without over heating? The motor has maximum efficiency at full load. **6 M**

UNIT-II

4. a) Explain different types of resistance welding. **4 M**
   b) A 20KW single-Phase, 220V resistance oven employs circular nichrome wire for its heating element, if the wire temperature is not to exceed 1127^0C and the temperature of the charge is to be 427^0C, calculate the size and length of the wire required. Assume emissivity = 0.9, radiating efficiency(k) = 0.6 and specific resistance of wire =1.09 X 10^{-6} Ω-m. **8 M**

(OR)

5. a) Compare A.C welding with D.C welding. **6 M**
   b) What is meant by induction heating ? what are its advantages? **6 M**

AR13

CODE: 13EE4029 **SET-2**

UNIT-III

6. a) What is meant by polar curve? What is its significance in illumination engineering? **6 M**

   b) Compare tungsten filament lamps with fluorescent tubes. **6 M**

(OR)

7. a) Explain laws of illumination. **6 M**

   b) A hall 12m X 8m X 4m is to have an illumination of 80 lux on the working plane 70 cm above the floor. Coefficient of utilisation is 0.5 and maintenance factor is 0.8. Determine the no of 40W fluorescent tubes required assuming the lamp efficiency as 40 lumen/watt. Assume suitable space height ratio. **6 M**

UNIT-IV

8. a) For a quadrilateral speed-time curve of an electric train, derive expression for the distance between stops and speed at the end of the coasting period **6 M**

   b) A train is required to run between stations 1.6kms apart at an average speed of 40km/hr. The run is to be made from a quadrilateral speed-time curve. If the maximum speed is to be limited to 64 kmph, acceleration to 2 kmphps, coasting and braking retardations to 0.16 kmphps and 3.2 kmphps respectively, dtermine the duration of acceleration, coasting and braking periods. **6 M**

(OR)

9. a) What are the special features of traction motor? **6 M**

   b) A train runs with an average speed of 40 kmph. Distance between the stations is 2km. Values of acceleration and retardation are 1.5 kmphps and 2.5 kmphps respectively. Find the maximum speed of train assuming trapezoidal speed- time curve **6 M**

UNIT-V

10. a) Define coefficient of adhesion. Explain the factors which influence the value of coefficient of adhesion. **6 M**

    b) Derive an equation for the specific energy consumption for a trapezoidal speed time curve **6 M**

(OR)

11 An electric train has an average speed between start to stop, Va = 42km/hr, on a level track between stops 1400 m apart. It is accelerated at 1.7 kmphps and braked at 3.3 kmphps . Estimate the specific energy consumption assuming the tractive resistance of 50 N/tonne and allowing 10% for rotational inertia. **12 M**

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AR13

CODE: 13ME4033 **SET-1**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2017
PRODUCTION PLANNIG & CONTROL
(Mechanical Engineering)

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

PART-A

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

1. Explain the following in brief:-
   a) Types of Production systems
   b) Exponential smoothening method
   c) Aggregate planning
   d) Assembly line balancing
   e) Quantity discount models
   f) Benefits of JIT
   g) LOB
   h) Job shop scheduling
   i) Routing procedure
   j) Types of expediting

PART-B

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

UNIT-I

2.	a)	Discuss the functions of production planning and control department.	**7**
	b)	Explain briefly the various forecast models	**5**
		(OR)	
3.		Discuss the demand forecasting problems for continuous production systems and job order production systems.	**12**

UNIT-II

4.		Explain how master schedule is prepared. Explain MPS preparation with suitable example.	**12**
		(OR)	
5.		Write the functions of MPS? Explain how MPS plays a major role in the material requirement planning.	**12**

UNIT-III

6.	a)	Explain P-system and Q-system of inventory management.	**8**
	b)	Explain the need of inventory management	**4**
		(OR)	
7.	a)	In the assembly of telephone sets, a particular item is reqired at the rate of 500 units per day. The same item can be produced at the rate of 1500 units/day. The set up cost per set up is Rs 400/-. Inventory carrying cost is Rs 2.00 per unit per year. The annual demand is 1,25,000 units. Determine the optimum production batch size for the production of the component.	**8**
	b)	Derive the expression for the economic batch size for finite production rate model.	**4**

AR13

CODE: 13ME4033 **SET-1**

UNIT-IV

8.	a)	Discuss the various factors affecting scheduling	**4**
	b)	Explain the detailed procedure of solving n jobs and three machines scheduling with suitable example	**8**
		(OR)	
9.	a)	Explain the difference between loading and scheduling	**6**
	b)	Explain the detailed procedure of solving two jobs and M machines scheduling with suitable example	**6**

UNIT-V

10.	a)	Explain the steps involved in the preparation of route sheet	**6**
	b)	Discuss the various activities of dispatcher.	**6**
		(OR)	
11.	a)	Discuss in detail the difference between centralized and decentralized dispatching.	**6**
	b)	Discuss the role of computers in production control	**6**

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AR13

CODE: 13EC4036 **SET-2**

ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI
(AUTONOMOUS)
IV B.Tech II Semester Supplementary Examinations, June-2017
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) Why 800 MHz is used for cellular mobile radio system?
   b) Discuss briefly about permanent splitting.
   c) What are the factors that cause foliage loss?
   d) List the various techniques used to expand the capacity of a cellular system.
   e) Give the different vehicle locating methods.
   f) Briefly describe the effect of antenna height in near and long distance mobile Propagation.
   g) Mention the advantages of delayed handoffs.
   h) List various types of channel assignment in cellular and mobile communications.
   i) Mention the services of GSM.
   j) List the salient features of CSMA technique.

PART-B

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

UNIT-I

2. a) Illustrate the necessity of cellular mobile telephone system over conventional mobile telephone systems. **6 M**
   b) Describe in detail the concept of frequency reuse channels. **6 M**

(OR)

3. a) Describe the operation of the cellular mobile system from customer's perception. **6 M**
   b) Illustrate the cell splitting technique for improving the capacity of cellular systems. **6 M**

UNIT-II

4. a) Illustrate the propagation mechanism over flat and hilly terrains. **6 M**
   b) Explain how co-channel interference is measured in real time mobile radio trans-receivers. **6 M**

(OR)

5. a) What do you understand by large scale fading? Illustrate two-ray ground reflection model with necessary diagrams. **7 M**
   b) Explain the effects of antenna design parameters for the interference in a cellular system **5 M**

AR13

CODE: 13EC4036 **SET-2**

UNIT-III

6.	a)	Describe in detail about minimum separation of cell-site receiving antennas.	**4 M**
	b)	What type of handoff is used when a call initiated in one cellular system Enters another system before terminating? Explain how it works.	**8 M**
		(OR)	
7.	a)	Explain space diversity antennas used at cell site.	**6 M**
	b)	Illustrate the principle involved in intersystem handoff.	**6 M**

UNIT-IV

8.	a)	What is the difference between fixed channel assignment and non fixed channel assignment?	**6 M**
	b)	Write about channel assignment to travelling mobile units.	**6 M**
		(OR)	
9.	a)	Discuss the concept of frequency management concern to the numbering the channels and grouping into the subset.	**6 M**
	b)	Write notes on non-fixed channel assignment algorithms.	**6 M**

UNIT-V

10.	a)	Draw the TDMA frame structure and explain the significance of each slot.	**6 M**
	b)	Explain in detail about packet radio.	**6 M**
		(OR)	
11.	a)	Illustrate the features of slotted ALOHA in detail.	**6 M**
	b)	Write about the channel modes of GSM.	**6 M**

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