

# AR13

**CODE: 13CE4031**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B.Tech II Semester Supplementary Examinations, July-2018**

**FINITE ELEMENT METHODS**

**(Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 70**

## **PART-A**

**ANSWER ALL QUESTIONS**

**[1 x 10 = 10 M]**

1. a) Write the applications of FEM.
- b) Write any three assumptions in theory of elasticity problems.
- c) What is an interpolation function? Explain with an example.
- d) Distinguish between Area coordinates and volume coordinates.
- e) What is meant by element?
- f) Write the shape function for a two noded bar element.
- g) Define strain displacement relationship.
- h) Distinguish between CST & LST.
- i) Define Isoparametric elements.
- j) What are natural coordinates? Why numerical integration?

## **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

## **UNIT-I**

2. a) Write the advantages and disadvantages of FEM over Finite difference method 4M
  - b) Find out deflection at centre of a simply supported beam of length (L) subjected to a concentrated load W. Use Rayleigh Ritz method. Take EI is constant. 8M
- (OR)**
3. a) Derive the equations of equilibrium in case of a three dimensional stress system. 6M
  - b) Explain the terms 'Plane stress' and 'Plane strain' problems. Give constitutive laws for these cases. 6M

**UNIT-II**

4. Derive the general equation for determining the stiffness of an element with usual notations in the form  
 $[k]_e = \iiint [B]^T [D] [B] dV$  12M

**(OR)**

5. a) Derive the expression for shape function for a two noded bar element taking natural coordinate  $\xi$  as varying from -1 to 1. 6M  
b) Distinguish between natural coordinate system, global coordinate system and local coordinate system. 6M

**UNIT-III**

6. Derive the stiffness matrix for a three noded constant strain triangle element 12M

**(OR)**

7. Develop a strain-displacement matrix for four noded rectangle element 12M

**UNIT-IV**

8. a) Explain the isoparametric elements and their advantages. 6M  
b) Using Lagrange polynomial find shape functions for Two noded bar element. Sketch the shape function. 6M

**(OR)**

9. Derive the shape functions for a 4 node rectangular element using serendipity method. 12M

**UNIT-V**

10. Explain the axisymmetric problem with suitable examples using FEM 12M

**(OR)**

11. Describe briefly about static condensation 12M

# AR13

**CODE: 13EE4029**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B.Tech II Semester Supplementary Examinations, July-2018**

## **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) Define the term “intermittent rating”?
- b) Define the term candle power?
- c) What is a polar curve?
- d) What are the applications of resistance welding?
- e) Define adhesive weight?
- f) What is meant by welding electrode?
- g) What is meant by dielectric heating?
- h) Define the term “short time rating”?
- i) What is meant by the term specific energy consumption?
- j) Define the term tractive effort?

### **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

#### **UNIT-I**

2. Derive expression for acceleration time of an electric drive under the condition constant motor and load torque. 12M

**(OR)**

3. Compare DC and AC drives. Discuss the advantage of electric drives. 12M

#### **UNIT-II**

4. Explain the principle of electric spot welding and seam welding. 12M

**(OR)**

5. Describe briefly the various types of arc welding process used in industry. 12M

#### **UNIT-III**

6. Derive the expressions for the illumination on a surface (i) when it is normal and (ii) when it is inclined to the axis of a beam of incident light. 12M

**(OR)**

7. Describe the construction and working of a filament lamp. 12M

#### **UNIT-IV**

8. Sketch the typical speed–time curves for (i) Main line service and (ii) Suburban service with electric traction. 12M

**(OR)**

9. An electric train is to have acceleration and braking retardation of 0.8 km/h/s and 3.2 km/h/s respectively. If the ratio of maximum to avg speed is 1:3 and time for stops 26 sec. find schedule speed for a run of 1.5km. assume simplified trapezoidal speed – time curve. 12M

#### **UNIT-V**

10. What are the advantages and disadvantages of the D.C and 1-single phase A.C systems for the main and suburban line electrification of the railways? 12M

**(OR)**

11. 400 tonnes goods train is to be hauled by a locomotive up a gradient of 2% with acceleration of 1km/h/s. Coefficient of adhesion is 20%, track resistance 40 N/tonne and effective rotating masses 10% of the dead weight. Find the weight of the locomotive and number of axes if the axle load is not to increase beyond 22 tonnes. 12M

# AR13

**CODE: 13ME4033**

**SET-2**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B.Tech II Semester Supplementary Examinations, July-2018**

**PRODUCTION PLANNING & 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) Functions of PPC
  - b) Classification of forecasting techniques
  - c) Capacity planning
  - d) Functions of MPS
  - e) Functions of inventories
  - f) KANBAN system
  - g) Flow shop scheduling
  - h) Sequencing by priority rules
  - i) Bill of materials
  - j) Role of expediting

## **PART-B**

**Answer one question from each unit**

**[5x12=60M]**

### **UNIT-I**

2. What is the difference between long term planning and short term planning? Discuss the situations when they will be applicable in production planning and control. **12M**

**(OR)**

3. a) Discuss the various types of production systems and their characteristics in detail. **6M**  
b) Distinguish between exponential smoothening method and casual forecasting method. **6M**

### **UNIT-II**

4. a) What is aggregate planning? Discuss **6M**  
b) Highlight the various factors influencing the effective capacity planning **6M**

**(OR)**

5. How master production schedule plays a major role in the planning of capacity requirements and material procurements. **12M**

**UNIT-III**

6. a) The annual demand of an item is 10,000 units, the annual holding costs are 20% of the unit cost and the ordering costs are 100 per order. Shortages are not allowed. The unit price is shown in the table. **8M**

Order size	% of discount	Cost/item
0-1499	0	10
1500-2499	2	9.8
2500+	5	9.5

Determine the economic purchase quantity.

- b) Explain the objective of inventory control. Briefly discuss the different measures of inventory performance **4M**

**(OR)**

7. a) What are the different inventory costs? Briefly explain them. **6M**
- b) Explain P & Q systems with neat sketches **6M**

**UNIT-IV**

8. a) Define scheduling and loading. State clearly their main objectives. **6M**
- b) Classify the different approaches of job sequencing by priority rules. **6M**

**(OR)**

9. a) Explain the LOB technique with suitable example. **6M**
- b) What are the characteristics of the job shop? Discuss **6M**

**UNIT-V**

10. a) What is meant by progress control? Briefly explain different methods of progress control. **6M**
- b) Explain what do you mean by dispatching. Enumerate the duties of dispatcher. **6M**

**(OR)**

11. a) Discuss the role of computers in production planning and control **6M**
- b) Explain the following **6M**

1) Types of expediting 2) Role of Dispatcher

# AR13

**CODE: 13EC4036**

**SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI  
(AUTONOMOUS)**

**IV B.Tech II Semester Supplementary Examinations, July-2018**

**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) Distinguish between 1G and 2G cellular networks.  
b) What is meant by a cluster in a cellular network?  
c) Define co-channel interference.  
d) What is line of sight path?  
e) List different mobile antennas.  
f) What is meant by triangulation?  
g) Define frequency management in a cellular system.  
h) Define reverse link channel in a cellular system.  
i) Mention the value of maximum throughput for slotted ALOHA.  
j) Name the modulation technique employed in GSM.

**PART-B**

**Answer one question from each unit**

**[5x12=60M]**

**UNIT-I**

2. a) Explain the operation of basic cellular system. **6M**  
b) Prove cluster size  $K=4$  is not sufficient to meet desired C/I in Omni directional antenna system. **6M**
- (OR)**
3. a) What is Cell Splitting? Explain. **7M**  
b) What is frequency reuse? Determine the number of cells in cluster for the following values of shift parameters in hexagonal geometry. **5M**
  - i)  $i=2$  and  $j=4$
  - ii)  $i=3$  and  $j=3$

**UNIT-II**

4. a) Explain the mobile signal propagation over water between two fixed stations. **6M**  
b) Describe different types of non co-channel interference in cellular systems. **6M**
- (OR)**
5. a) Explain about foliage loss. **5M**  
b) Explain different forms of Lee model. **7M**

**UNIT-III**

6. a) What are the different types of antennas used for reducing interference at cell site? **6M**  
b) Explain the factors that influence dropped call rate. **6M**
- (OR)**
7. a) Explain the combining techniques employed in diversity receiver. **6M**  
b) Explain Intra system, Intersystem and forced handoffs. **6M**

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**SET-1**

## UNIT-IV

8. a) Explain different channel assignment algorithms. **6M**  
b) Explain the operational functions of setup channels. **6M**
- (OR)**
9. a) Give the frequency spectrum allocation for channels in Cellular Mobile Communication. **6M**  
b) Distinguish between Channel sharing and Channel borrowing. **6M**

## UNIT-V

10. a) With neat sketch, explain the architecture of GSM. **6M**  
b) Explain pure ALOHA protocol in detail. **6M**
- (OR)**
11. a) Explain the features of CDMA network. **6M**  
b) Explain the frame structure of TDMA network. **6M**

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