

# AR18

**CODE: 18CET208**

**SET-2**

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

**II B.Tech II Semester Regular Examinations, November- 2020**

**MECHANICS OF SOLIDS-II  
(Civil Engineering)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## UNIT-I

1. A steel girder of uniform section, 14 meters long, is simply supported at its ends. It carries concentrated loads of 120 kN and 80 kN at two points 3 meters and 4.5 meters from the two ends respectively. (a) Calculate the deflection of the girder under the two loads. (b) The maximum deflection. 12 M
- Use Macaulay's Method. Take:  $I = 16 \times 10^4 \text{ m}^4$ , and  $E = 210 \times 10^6 \text{ KN/m}^2$ .

**(OR)**

2. A cantilever 3 m long is of rectangular section 120 mm wide and 240 mm deep it carries a UDL of 2.5 kN per meter length for a length of 1.5 m from the fixed end and two point loads of 1 kN and 2 kN are acting at 2 m from fixed end and at the free end respectively. Find the slope and the deflection at the free end. Take  $E = 10 \text{ GN/ m}^2$ . Using moment area method. 12 M

## UNIT-II

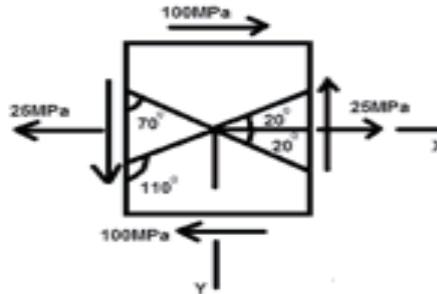
3. A compound cylinder is formed by shrinking a tube of 200 mm internal diameter and 20 mm thick over another tube of 120 mm diameter and 40 mm thick. If radial pressure at the common surface, after shrinking is  $12 \text{ N/mm}^2$ , then determine the final stresses across the section when a fluid under a pressure of  $45 \text{ N/mm}^2$  is admitted into the cylinder. 12 M

**(OR)**

4. a) Derive the expressions for hoop and longitudinal strains and volumetric strain for a thin cylindrical shell 6 M
- b) A closed cylindrical vessel made of steel plates 5mm thick with plane ends, carries fluid under a pressure of  $3.5 \text{ N/mm}^2$ . The dia. of cylinder is 30 mm and the length is 80 cm, calculate the longitudinal and hoop stresses in the cylinder wall and determine the change in diameter and change in length of the cylinder. Take  $E = 2.1 \times 10^5 \text{ N/mm}^2$  and  $\mu = 0.286$ . 6 M

### UNIT-III

5. A plane element in a body is subjected to a normal stress of 25 MPa in +ve x- 12 M direction and counter clockwise shear of 100 MPa as shown in fig..Calculate the stresses at two planes, (i)  $20^\circ$  clockwise and (ii)  $20^\circ$  anticlockwise to x-axis by using Mohr's circle.



(OR)

6. A rectangular block of material is subjected to tensile stress of  $110 \text{ N/mm}^2$  on one 12 M plane and a tensile stress of  $47 \text{ N/mm}^2$  on a plane at right angles, together with shear stresses of  $63 \text{ N/mm}^2$  on the same planes. Calculate (a) the direction and magnitude of principal stresses. (b) the magnitude of greatest shear stress.

### UNIT-IV

7. Obtain critical load for a column hinged at both ends. 12 M

(OR)

8. A hollow Cast iron column whose outside diameter is 200mm has a thickness of 20mm. it is 4.5m long and is fixed at both ends. Calculate the safe load using Rankin's formulae using a factor of safety of 4. Calculate the slenderness ratio and the ratio of Euler's and Rankin's critical loads. For cast iron take  $f_c = 550 \text{ N/mm}^2$  and  $\alpha = 1/1600$ ,  $E = 8 \times 10^4 \text{ N/mm}^2$ . 12 M

### UNIT-V

9. A masonry trapezoidal dam 4m high, 1m wide at top and 3m wide at bottom 12 M retains water on its vertical face. Determine (i) The resultant force on the dam per metre length. (ii) The point where the resultant cuts the base, and (iii) the maximum and minimum stresses at the base when the reservoir is full. Take weight of water as  $10 \text{ kN/m}^3$  and that of masonry as  $24 \text{ kN/m}^3$ .

(OR)

10. A masonry retaining wall of trapezoidal section is 8 m high and retains earth 12 M which is level upto the top. The width at the top is 1.5 m and exposed face is vertical. Find the minimum width of the wall at the bottom in order the tension may not be induced at the base. Masonry and earth has densities  $2300 \text{ kg/m}^3$  and  $1600 \text{ kg/m}^3$  respectively. The angle of repose of the soil is  $30^\circ$ .

# AR18

**CODE: 18EET208**

**SET-2**

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

**II B.Tech II Semester Regular Examinations, November- 2020**

## **POWER SYSTEMS-I**

**(Electrical and Electronics Engineering)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

### **UNIT-I**

1. What are the devices used to increase efficiency of Thermal Power plant and Explain? 12M

**(OR)**

2. What are the factors to be considered for the selection of site of Thermal power plant? 12M

### **UNIT-II**

3. Classify Solar collectors in detail? 12M

**(OR)**

4. Draw the diagram of Nuclear Reactor and Explain the components? 12M

### **UNIT-III**

5. a) What are the design features of Distribution systems? 6M  
b) Write differences between Radial and Ring distribution systems? 6M

**(OR)**

6. Explain Ring main and Radial distributor? 12M

### **UNIT-IV**

7. Explain Air Insulated Substations? 12M

**(OR)**

8. Draw one line diagram of 33/11KV and Explain each component? 12M

### **UNIT-V**

9. Define the following terms : Demand factor, Load factor, Diversity factor and Plant Capacity factor with formulas? 12M

**(OR)**

10. Define Tariff and Discuss various types of Tariff? 12M

# AR18

**CODE: 18MET206**

**SET-2**

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

**II B.Tech II Semester Regular Examinations, November- 2020**

**MANUFACTURING TECHNOLOGY -I  
(Mechanical Engineering)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## UNIT-I

- |    |    |  |    |
|----|----|--|----|
| 1. | a) | Explain pattern allowances with neat sketches                                | 6M |
|    | b) | Explain the shell moulding process. Write merits and demerits of the process | 6M |

**(OR)**

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|----|----|--|----|
| 2. | a) | Explain the casting defects and their remedies   | 6M |
|    | b) | Calculate the size of a cylindrical riser (height and diameter equal) necessary to feed a steel slab casting 25X25X5 cm with a side riser casting poured horizontally into the mould | 6M |

## UNIT-II

- |    |    |  |    |
|----|----|--|----|
| 3. | a) | Explain the principle of arc welding process.  | 4M |
|    | b) | Explain oxyacetylene welding principle, advantages, disadvantages and applications of the process with neat sketch | 8M |

**(OR)**

- |    |    |   |    |
|----|----|---|----|
| 4. | a) | Explain the principle of metal inert gas welding process and its applications | 8M |
|    | b) | Explain the principle of thermit welding process and its applications         | 4M |

## UNIT-III

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|----|----|--|----|
| 5. | a) | Explain tube drawing process   | 4M |
|    | b) | If the maximum reduction in rolling of slab is from 25 to 20mm. Calculate the value of coefficient of friction. Take the roll diameter as 500mm. Also find the length of projection of arc of contact. | 8M |

**(OR)**

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|----|----|---|----|
| 6. | a) | Explain various types of extrusion processes with neat sketches | 8M |
|    | b) | Differentiate hot working and cold working processes            | 4M |

## UNIT-IV

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|----|----|--|----|
| 7. | a) | Explain various types of forging processes with neat sketches  | 6M |
|    | b) | In open die forging a disc of diameter 200mm and height 60mm is compressed with out any barreling effect. The final diameter of disc is 400mm. Find the true strain. | 6M |

**(OR)**

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|----|----|--|----|
| 8. | a) | Describe clearances for die and punch (i) Blanking (ii) Punching | 6M |
|    | b) | Explain Embossing and coining processes                          | 6M |

## UNIT-V

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|----|----|--|----|
| 9. | a) | Describe magnetic pulse forming process and its applications                 | 6M |
|    | b) | Describe principle of electro hydraulic forming process and its applications | 6M |

**(OR)**

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|-----|----|--|----|
| 10. | a) | Explain the principle of injection moulding                  | 6M |
|     | b) | Describe the principle of blow moulding and its applications | 6M |

# AR18

**CODE: 18ECT210**

**SET-2**

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

**II B.Tech II Semester Regular Examinations, November- 2020**

**PULSE AND DIGITAL CIRCUITS  
(Electronics and Communication Engineering)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## **UNIT-I**

1. a) Explain about RL and RLC series Circuits When the input is step is applied 6M  
b) Explain integrator with the help of neat sketches 6M
- (OR)**
2. a) Show that RC low pass circuits acts as an integrator. 6M  
b) Explain the response of RC low pass circuit to the ramp input. 6M

## **UNIT-II**

3. a) Explain two level clipper (slicer) with neat sketch. 9M  
b) Explain clamping circuit theorem. 3M
- (OR)**
4. a) Discuss about Clamping circuit theorem. 6M  
b) Explain about clipping at two independent levels with example. 6M

## **UNIT-III**

5. a) Explain the operation of Bistable multivibrator with circuit diagram and waveforms. 8M  
b) Discuss about transistor-switching times. 4M
- (OR)**
6. a) Explain the operation of Fixed-Bias Bistable multivibrator with circuit diagram and waveforms. 6M  
b) Explain how a transistor can be used as a switch. 6M

## **UNIT-IV**

7. a) With the help of neat circuit diagram and waveforms, explain the working of a Astable Multivibrator. 8M  
b) Explain about monostable multivibrator. 4M
- (OR)**
8. a) Explain how to draw the various waveforms and calculate their voltage levels in an emitter-coupled monostable multi vibrator 6M  
b) Explain how Schmitt trigger circuit act as a switch. 6M

## **UNIT-V**

9. a) Explain about Sampling gates. 4M  
b) Explain Miller timebase generator 8M
- (OR)**
10. a) Explain any one method of generating time base waveform 6M  
b) With the help of neat diagram explain the working of transistor Bootstrap time base generator 6M

# AR18

**CODE: 18CST207**

**SET-2**

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

**II B.Tech II Semester Regular Examinations, November- 2020**

**DATABASE MANAGEMENT SYSTEMS  
(Common to CSE AND IT)**

**Time: 3 Hours**

**Max Marks: 60**

Answer ONE Question from each Unit

All Questions Carry Equal Marks

All parts of the Question must be answered at one place

## **UNIT-I**

- |       |   |    |
|-------|---|----|
| 1. a) | Draw and explain the three level architecture of database system. | 6M |
| b)    | Explain the draw backs of conventional file processing system.    | 6M |

**(OR)**

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|-------|--|----|
| 2. a) | Explain in detail about various constraints used in relational model | 6M |
| b)    | Mention and explain about various database users.                    | 6M |

## **UNIT-II**

- |       |  |    |
|-------|--|----|
| 3. a) | Explain the following  | 6M |
|       | i) Entity set      ii) Relationship set      iii) Weak-entity set.       |    |
| b)    | Specify and explain various structural constraints of relationship type. | 6M |

**(OR)**

- |    |   |     |
|----|---|-----|
| 4. | Explain various relational algebra operations with suitable examples. | 12M |
|----|---|-----|

## **UNIT-III**

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|-------|---|----|
| 5. a) | What is a group function? List and explain how to use group functions in SQL with appropriate examples. | 6M |
| b)    | Explain in detail about hashing techniques.   | 6M |

**(OR)**

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|-------|---|----|
| 6. a) | Write and explain about structure of SQL statement with examples. | 6M |
| b)    | Explain about null values with examples.                          | 6M |

## **UNIT-IV**

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|-------|---|----|
| 7. a) | Why the functional dependency is needed? Explain about irreducible Functional Dependency Set. | 6M |
| b)    | Explain in detail about First, Second and Third normal forms with examples.                   | 6M |

**(OR)**

- |       |   |    |
|-------|---|----|
| 8. a) | Draw and explain about transaction state diagram. | 6M |
| b)    | Describe two-phase locking protocol.              | 6M |

## **UNIT-V**

- |       |   |    |
|-------|---|----|
| 9. a) | Explain ARIES recovery algorithm.                   | 6M |
| b)    | Explain in detail about internal hashing Techniques | 6M |

**(OR)**

- |        |  |    |
|--------|--|----|
| 10. a) | Discuss in detail about primary and secondary indexes..                              | 6M |
| b)     | By considering relevant example, show insertion and deletion operations on a B+Tree. | 6M |