# AR18

**CODE: 18CET208** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**II B.Tech II Semester Supplementary Examinations, February, 2021**

**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) Derive the expression showing the relation between the slope, deflection and radius of curvature. 6 M

   b) A beam of uniform rectangular section 100 mm wide and 240 mm deep is simply supported at its ends. It carries a uniformly distributed load of 9.125 kN/m run over the entire span of 4 m. Find the deflection at the centre if E =1.1 x $10^4$N/mm$^2$. 6 M

**(OR)**

2. A cantilever 15 cm wide and 20 cm. deep projects 1.5 m out of a wall and is carrying a point load of 20 kN at the free end and Uniformly distributed load 20 kN/m over the entire length. Find the slope and deflection of the cantilever at the free end using Moment Area Method. Take E = 210 GN/m$^2$. 12 M

## UNIT-II

3. a) Derive the expressions for hoop and longitudinal stress for a thin cylindrical shell. 6 M

   b) A cylindrical thin drum 800 mm in diameter and 3m long has a shell thickness of 10 mm. If the drum is subjected to an internal pressure of 2.5 N/mm$^2$, determine 6 M

   (a) Hoop stress b) Longitudinal stress c) Change in diameter

   (d) Change in length. Take E = 2 X $10^5$ N/mm$^2$, $\mu$ = 0.25.

**(OR)**

4. A Pipe of internal diameter 400 mm and having radial pressure 8Mpa and thickness 100 mm and external diameter 600 mm ,there is no external radial pressure on the pipe .find the maximum and minimum hoop stress across the section .also sketch the radial pressure distribution and hoop stress distribution across the section. 12 M

## UNIT-III

5. a) At a point in a material, the stresses acting on two planes right angles to each other are: $\sigma_z$ =120 MPa, $\sigma_y$ =-200 MPa, $\tau_{zy}$= -80 MPa. Determine: (a) the direction and magnitude of the principal stresses, (b) the maximum shear stress, 7 M

   b) Derive normal and tangential stresses for member subjected to direct stresses in one plane. 5 M

**(OR)**

6. a) The principal tensile stresses at a point across two perpendicular planes are 80 N/mm$^2$ and 40 N/mm$^2$. Determine: (a) resultant stress (b) Obliquity of the resultant plane on a plane at 20$^0$ with the major principal axes 5 M

   b) A rectangular bar is subjected to 120 N/mm$^2$ (Tensile) and 80 N/mm$^2$ (Tensile) in mutual perpendicular direction and a shear stress of 30 N/mm$^2$. Find the normal and tangential stress on a oblique plane making an angle of 30$^0$ using Mohr's circle. 7 M

## UNIT-IV

7. Compare the crippling loads given by Rakine's and Euler's formulae for tubular strut 2.4m long having outer and inner diameters of 40.5mm and 35.5mm loaded through pin-joint at both ends. Take: Yield stress as 315MN/m$^2$; Rankine constant a=1/7500, and E=200 GN/m$^2$.If elastic limit for the material is taken as 200MN/m$^2$. 12 M

**(OR)**

8. Derive Euler's theory for long column when one end is fixed and other end is free. Mention the assumptions made in Euler's theory 12 M

## UNIT-V

9. A trapezoidal masonry dam having 1.5 m top width , 4 m bottom width and 15 m high, retains water upto a height of 12 m 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 10KN/m$^3$ and that of masonry as 24KN/m$^3$. 12 M

**(OR)**

10. Draw neat sketches of kernel of the following cross section: 12 M

    (i) Rectangular section 230 mm and 350 mm

    (ii) Hollow cylinder with external dia = 400 mm and thickness = 60 mm

    (iii) Square with 450 cm$^2$ area.



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# AR18

**CODE: 18MET206** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**II B.Tech II Semester Supplementary Examinations, February, 2021**

**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) | Define casting. Explain different steps in the casting process | 6M |
| | b) | Explain the $CO_2$ moulding process. Write merits and demerits of the process | 6M |
| | | **(OR)** | |
| 2. | a) | Explain the construction & operation of Induction furnace with a neat sketch | 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. Solve using modulus method | 6M |

**UNIT-II**

| | | | |
|---|---|---|---|
| 3. | a) | Explain the principle of resistance welding process. | 4M |
| | b) | Explain MIG welding principle , advantages, disadvantages and applications of the process with neat sketch | 8M |
| | | **(OR)** | |
| 4. | a) | Explain the principle of submerged arc welding process and its applications | 8M |
| | b) | Explain the principle of Laser welding process and its applications | 4M |

**UNIT-III**

| | | | |
|---|---|---|---|
| 5. | a) | Differentiate hot working and cold working processes | 4M |
| | b) | In a rolling operation using rolls of diameter 500mm if a 25mm thick plate cannot be reduced to less than 20mm in one pass then calculate the coefficient of friction between the roll and plate . | 8M |
| | | **(OR)** | |
| 6. | a) | Explain different extrusion processes | 8M |
| | b) | Explain tube drawing process | 4M |

**UNIT-IV**

| | | | |
|---|---|---|---|
| 7. | a) | Explain various types of forging processes with neat sketches | 6M |
| | b) | Explain cup drawing, Embossing and coining. | 6M |
| | | **(OR)** | |
| 8. | a) | Describe clearances for die and punch (i) Blanking (ii) Punching | 4M |
| | b) | For punching a 10mm circular hole and cutting a rectangular blank of 50X200mm from a sheet of 1mm thickness(Mild steel, shear tress=240N/mm2). calculate in each case (i) Size of punch(ii) size of die (iii) force required. | 8M |

**UNIT-V**

| | | | |
|---|---|---|---|
| 9. | a) | Describe explosive forming process and its applications | 6M |
| | b) | Describe principle of Electro hydraulic forming process and its applications | 6M |
| | | **(OR)** | |
| 10. | a) | Explain the principle of injection moulding | 6M |
| | b) | Describe the principle of blow moulding and its applications | 6M |



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# AR18

**CODE: 18ECT210** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**II B.Tech II Semester Supplementary Examinations, February 2021**

**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 RC low pass circuit as a integrator | 8M |
| | b) | Explain the response of RC low pass circuit for step input signal. | 4M |
| | | **(OR)** | |
| 2. | a) | Explain differentiator circuit with the help of neat sketches. | 6M |
| | b) | Compare integrater and attenuator. | 6M |

**UNIT-II**

| | | | |
|---|---|---|---|
| 3. | a) | Draw the basic circuit diagram of positive peak clamper circuit and explain its operation. | 6M |
| | b) | Explain about Emitter coupled clipper. | 6M |
| | | **(OR)** | |
| 4. | a) | Explain about two level clipper using Transfer characteristics. | 8M |
| | b) | Explain comparator. | 4M |

**UNIT-III**

| | | | |
|---|---|---|---|
| 5. | a) | Explain how a transistor can be used as a switch. | 6M |
| | b) | Explain the operation of Bistable multivibrator with circuit diagram and waveforms. | 6M |
| | | **(OR)** | |
| 6. | a) | Illustrate the operation of Schmitt trigger. | 6M |
| | b) | What are the uses of commutating capacitors. | 6M |

**UNIT-IV**

| | | | |
|---|---|---|---|
| 7. | a) | Explain Astable multivibrator with neat sketches.. | 6M |
| | b) | Explain monostable multivibrator. | 6M |
| | | **(OR)** | |
| 8. | a) | Draw the various wave shapes of the astable multi vibrator. | 6M |
| | b) | Explain the operation of Astable multivibrator. | 6M |

**UNIT-V**

| | | | |
|---|---|---|---|
| 9. | a) | Explain the bi-directional sampling gate. | 6M |
| | b) | Explain about uni-directional sampling gate. | 6M |
| | | **(OR)** | |
| 10. | a) | Define sweep speed error, transmission error and displacement error pertaining to sweep circuits. Also derive the expressions for the same with respect to an exponential sweep circuit. How are linearly varying current waveforms generated? | 6M |
| | b) | Explain Transistor miller time base generator. | 6M |



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# AR18

**CODE: 18CST207** **SET-1**

**ADITYA INSTITUTE OF TECHNOLOGY AND MANAGEMENT, TEKKALI**

**(AUTONOMOUS)**

**II B.Tech II Semester Supplementary Examinations, February, 2021**

**DATABASE MANAGEMENT SYSTEMS**

**(Common to CSE & 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 detailed system structure of database system. | 6 M |
| | b) | What are the advantages of DBMS? Explain them, | 6 M |
| | | **(OR)** | |
| 2. | a) | Write short notes on<br>i. Schema ii. Instance iii. Data Abstraction | 6 M |
| | b) | What is a relational model? Explain its concept. | 6 M |

## UNIT-II

| | | | |
|---|---|---|---|
| 3. | a) | Discuss in detail about various concepts used in ER-model. | 6 M |
| | b) | Draw an E-R diagram for a Hospital Management system with all components and Explain. | 6 M |
| | | **(OR)** | |
| 4. | a) | Describe the properties of a relation. | 6 M |
| | b) | What is a view? How views are implemented? | 6 M |

## UNIT-III

| | | | |
|---|---|---|---|
| 5. | a) | By considering an example describe various data update operations in SQL. | 6 M |
| | b) | What is outer join? Explain different types of outer joins in SQL with examples. | 6 M |
| | | **(OR)** | |
| 6. | a) | List and explain the common data types available in SQL. | 6 M |
| | b) | Explain the concept of trigger with appropriate example. | 6 M |

## UNIT-IV

| | | | |
|---|---|---|---|
| 7. | a) | Describe guidelines of database design. | 6 M |
| | b) | Explain how the 3NF is different from Boyce Codd Normal form. | 6 M |
| | | **(OR)** | |
| 8. | a) | Describe the properties of a transaction. | 6 M |
| | b) | What is serializability? Explain its concept. | 6 M |

## UNIT-V

| | | | |
|---|---|---|---|
| 9. | a) | Discuss in detail about different types of failures. | 6 M |
| | b) | Describe the concept of shadow paging technique. | 6 M |
| | | **(OR)** | |
| 10. | a) | Describe various methods of defining indexes on multiple keys. | 6 M |
| | b) | Explain different record formats with examples. | 6 M |



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