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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations Feb-2021

ENGINEERING MECHANICS

(Common to CE, AGE & ME)

Time: 3 hours

Max. Marks: 60

PART-A(Answer all the Questions $5 \times 2 = 10$ Marks)

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|---|---|---|----|
| 1 | a | Classify any two system of forces with suitable examples. | 2M |
| | b | Define Limiting Force of Friction. | 2M |
| | c | Define truss. | 2M |
| | d | Define Parallel Axis Theorem. | 2M |
| | e | What is meant by perfect frame? | 2M |

PART-B(Answer all Five Units $5 \times 10 = 50$ Marks)**UNIT-I**

- | | | | |
|---|---|---|----|
| 2 | a | Explain free body diagram with example. | 5M |
| | b | State and prove Lami's theorem. | 5M |

OR

- | | | | |
|---|---|---|----|
| 3 | a | Classify different system of forces with suitable examples. | 5M |
| | b | The resultant of the two forces, when they act at an angle of 60° is 14 N. If the same forces are acting at right angles, their resultant is $\sqrt{137}$ N. Determine the magnitude of the two forces | 5M |

UNIT-II

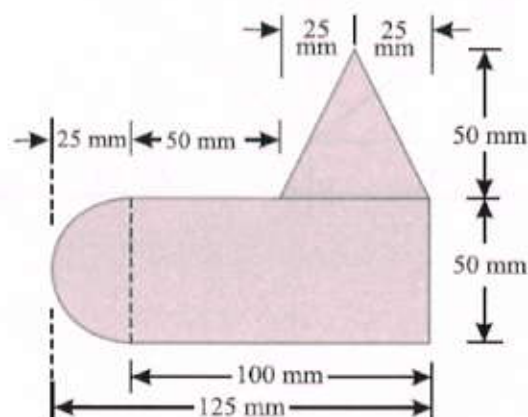
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|---|---|---|----|
| 4 | a | State laws of friction. | 5M |
| | b | Explain Cone of Friction with a neat sketch | 5M |

OR

- | | | |
|---|---|-----|
| 5 | A body, resting on a rough horizontal plane, required a pull of 180 N inclined at 30° to the plane just to move it. It was found that a push of 220 N inclined at 30° to the plane just moved the body. Determine the weight of the body and the coefficient of friction. | 10M |
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UNIT-III

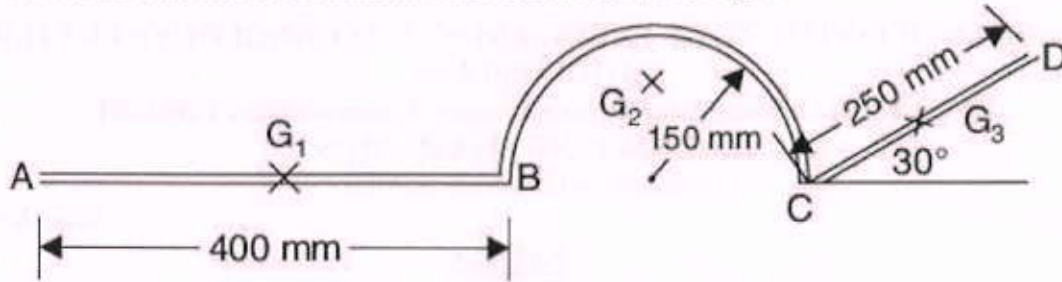
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|---|--|-----|
| 6 | A uniform lamina shown in Fig. 11 consists of a rectangle, a circle and a triangle. Determine the center of gravity of the lamina. All dimensions are in mm. | 10M |
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OR

- 7 Locate the centroid of the uniform wire bent as shown in Fig.13

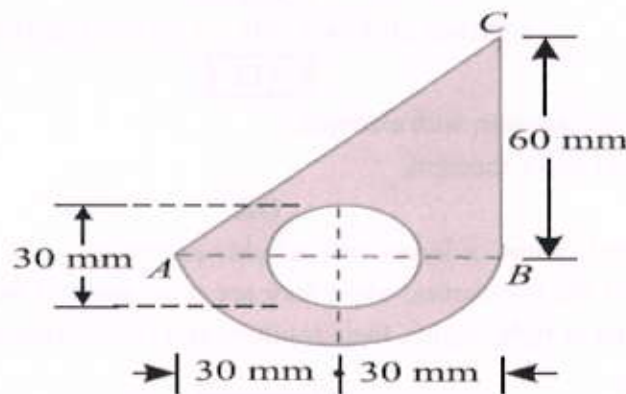
10M



All dimensions in mm

UNIT-IV

- 8 Find the moment of inertia of the lamina with a circular hole of 30 mm diameter about the axis AB as shown in Fig. 10M

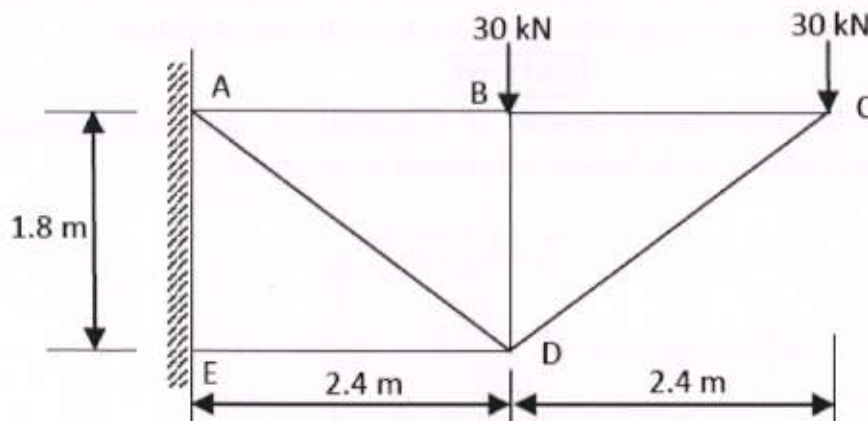


OR

- 9 Prove the parallel axis theorem in the determination of moment of inertia of areas with the help of a neat sketch. 10M

UNIT-V

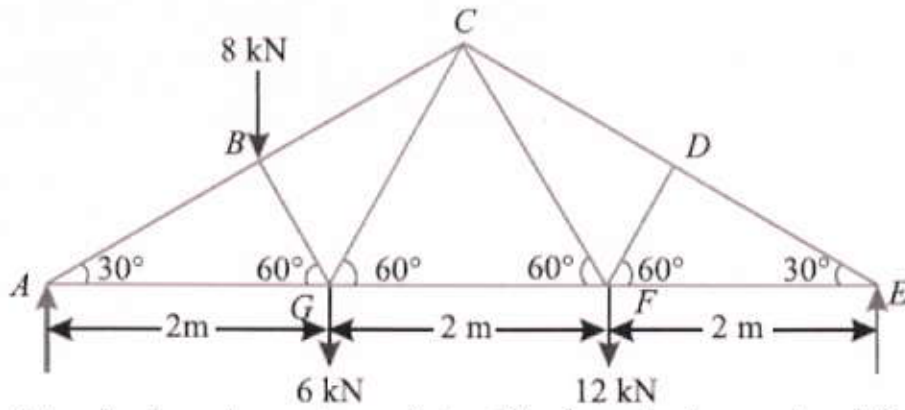
- 10 Find the forces in the members of a truss as shown in fig. 10M



OR

11 Analyze the members of a inclined truss loaded as shown in fig.

10M



Determine the nature and magnitude of the forces in the members BC, GC and GF of the truss.

END