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

**B.Tech I Year II Semester Regular Examinations November-2021**

**BASICS OF ENGINEERING MECHANICS**

(Common to ME & AG)

Time: 3 hours

Max. Marks: 60

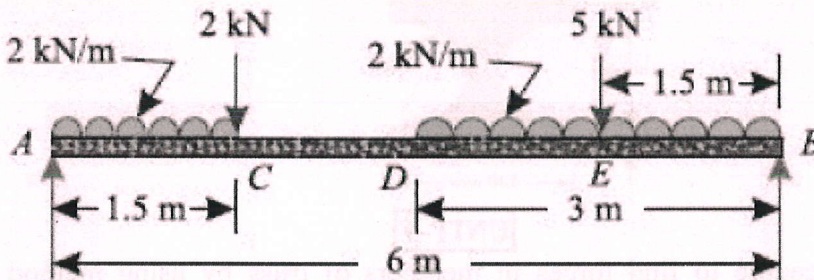
(Answer all Five Units  $5 \times 12 = 60$  Marks)

**UNIT-I**

- 1 a Classify different system of forces with suitable examples. L2 6M  
 b The resultant of the two forces, when they act at an angle of  $60^\circ$  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. L4 6M

OR

- 2 A simply supported beam AB of span 6 m is loaded as shown in Fig. Determine the reactions at A and B. L4 12M



**UNIT-II**

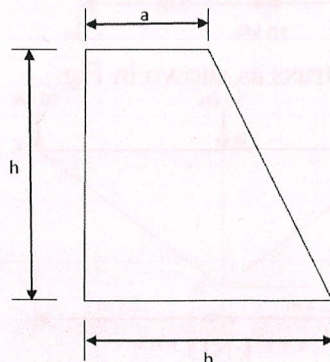
- 3 A ladder 5 meters long rests on a horizontal ground and leans against a smooth vertical wall at an angle  $70^\circ$  with the horizontal. The weight of the ladder is 900 N and acts at its middle. The ladder is at the point of sliding, when a man weighing 750 N stands on a rung 1.5 metre from the bottom of the ladder. Calculate the coefficient of friction between the ladder and the floor. L4 12M

OR

- 4 a State laws of friction. L1 6M  
 b Explain Cone of Friction with a neat sketch. L2 6M

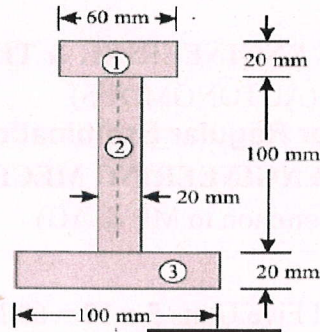
**UNIT-III**

- 5 Find the centroid of the section of a masonry dam as shown in the Fig. L4 12M



OR

- 6 An I-section is made up of three rectangles as shown in Fig. Find the moment of inertia of the section about the horizontal axis passing through the centre of gravity of the section. **L4 12M**

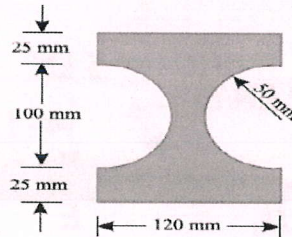


**UNIT-IV**

- 7 Derive an equation for moment of inertia of the following sections about centroidal Axis. (i) A rectangular section (ii) A triangular section from its base. **L4 12M**

OR

- 8 Figure shows the cross-section of a cast iron beam. Determine the moments of inertia of the section about horizontal and vertical axes passing through the centroid of the section. **L4 12M**

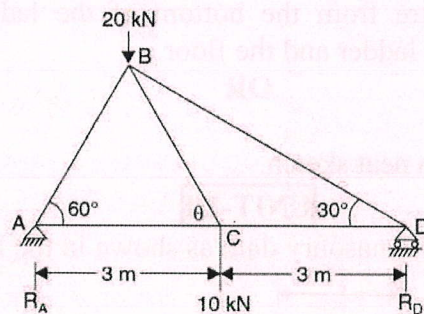


**UNIT-V**

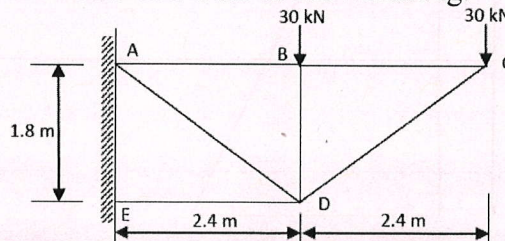
- 9 a Explain the procedure to find forces in members of truss by using method of joints. **L1 6M**  
 b Explain the procedure to find forces in members of truss by using method of sections. **L1 6M**

OR

- 10 a Determine the forces in all the members of the truss shown in Fig. **L5 6M**



- b Find the forces in the members of a truss as shown in Fig. **L1 6M**



\*\*\* END \*\*\*