Q.P. Code: 18CE0101

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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year II Semester Supplementary Examinations Dec 2019

ENGINEERING MECHANICS

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1 **a** What are the types of vibrations? **2M**

b Define the Parallel Axis Theorem. **2M**

c Differentiate between Angle of Friction & Angle of Repose. **2M**

d How method of joint differs from the method of section in the analysis of pin jointed trusses? **2M**

e Write down the Applications of Forces. **2M**

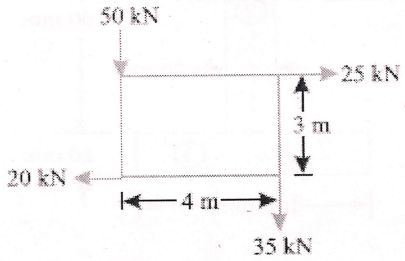
PART-B

(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

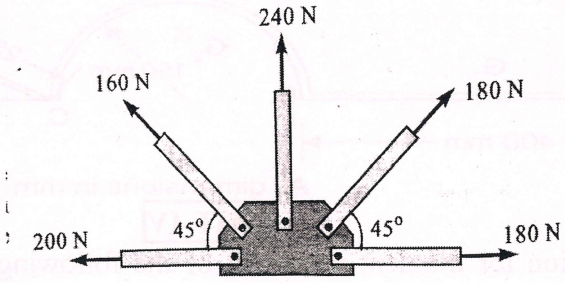
2 **a** State and prove parallelogram law of forces **5M**

b A system of forces is acting at the corners of a rectangular block as shown in Fig. Determine the magnitude and direction of the resultant force. **5M**



OR

3 A gusset plate of roof truss is subjected to forces as shown in Fig.. Determine the magnitude of the resultant force and its orientation measured counter clockwise from the positive x-axis. **10M**

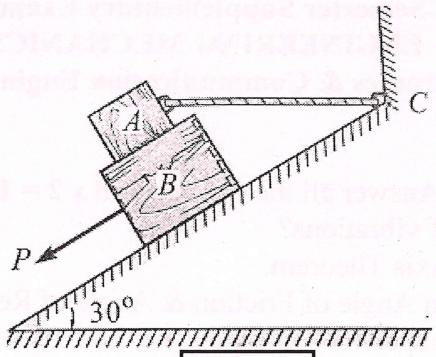


UNIT-II

4 A ladder 5 meters long rests on a horizontal ground and leans against a smooth vertical wall at an angle 70° 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 750N stands on a rung 1.5 metre from the bottom of the ladder. Calculate the coefficient of friction between the ladder and the floor. **10M**

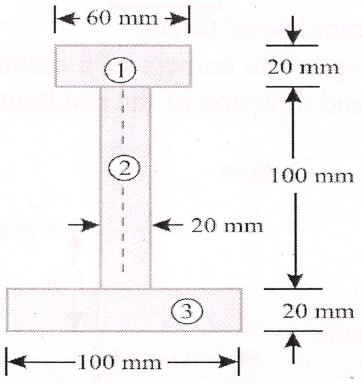
OR

5 Block A of mass 30 kg rests on block B of mass 40 kg as shown in Fig. Block A is restrained from moving by a horizontal rope tied at point C, what force P applied to the plane inclined at 30° with horizontal is necessary to start block B down the plane. Take coefficient of friction for all surfaces as 0.35. **10M**



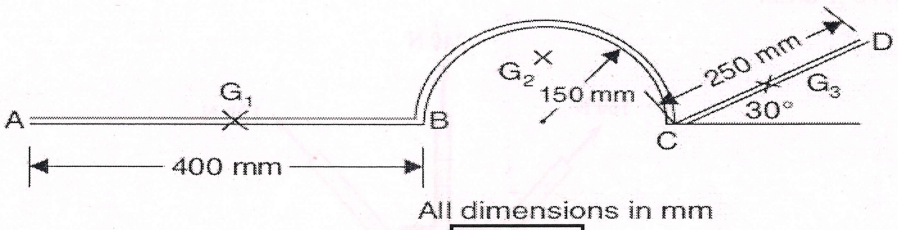
UNIT-III

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. **10M**



OR

7 Locate the centroid of the uniform wire bent as shown in Fig. **10M**



All dimensions in mm

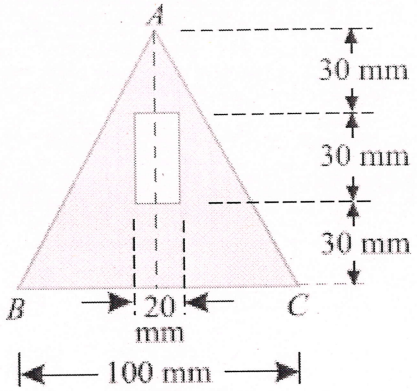
UNIT-IV

8 Derive an equation for moment of inertia of the following sections about centroidal axis i) A rectangular section. **6M**

ii)A triangular section from its base. **4M**

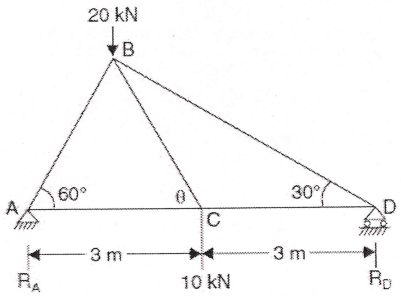
OR

9 A rectangular hole is made in a triangular section as shown in Fig. Determine the moment of inertia of the section about X-X axis passing through its centre of gravity and the base BC. **10M**



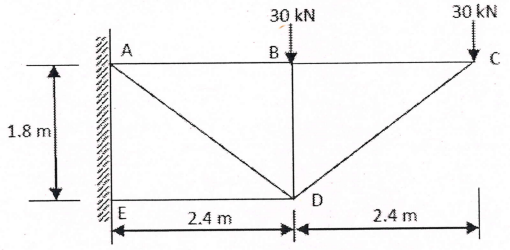
UNIT-V

10 Determine the forces in all the members of the truss shown in Fig **10M**



OR

11 Find the forces in the members of a truss as shown in fig **10M**



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