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

B.Tech I Year II Semester Supplementary Examinations July-2021

ENGINEERING MECHANICS

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 60

PART-A

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

- 1 a Write down the Applications of Forces. 2M
- b Define Kinetic Friction. 2M
- c What does Centre of Gravity mean? 2M
- d Define Polar Moment of Inertia. 2M
- e How method of joint differs from the method of section in the analysis of pin jointed trusses? 2M

PART-B

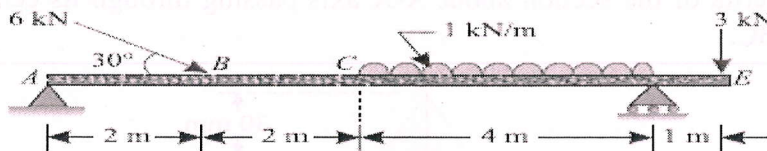
(Answer all Five Units 5 x 10 = 50 Marks)

UNIT-I

- 2 a State and prove parallelogram law of forces. 5M
- b 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

OR

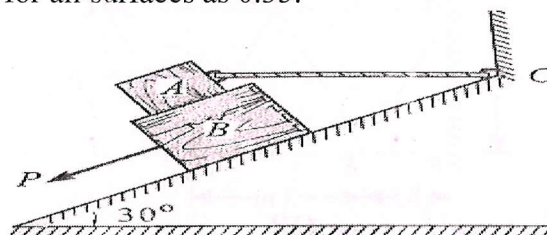
- 3 a State and prove Lami's theorem. 5M
- b A beam ABCDE hinged at A and supported on rollers at D, is loaded as shown in fig. Find the reactions at A and D. 5M

**UNIT-II**

- 4 a Explain Cone of Friction with a neat sketch. 5M
- b Find the least force required to drag a body of weight 'W' placed on a rough inclined plane having inclination ' α ' to the horizontal. The force is applied to the body in such a way that it makes an angle ' θ ' to the inclined plane and the body is on the point of motion up the plane. 5M

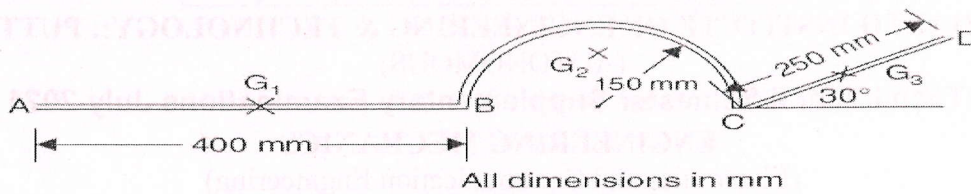
OR

- 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



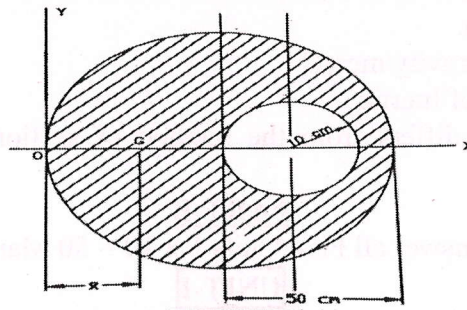
UNIT-III

- 6 Locate the centroid of the uniform wire bent as shown in fig. 10M



OR

- 7 Determine the centroid of the remaining portion of a circular sheet of metal of radius 50 cm when a hole of 10 cm radius is taken out from the Centre of the circular disc along its horizontal diameter as shown in fig. 10M

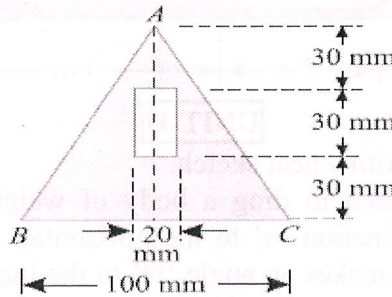


UNIT-IV

- 8 Derive an equation for moment of inertia of the following sections about centroidal axis: 10M
- i) A rectangular section
 - ii) A triangular section from its base

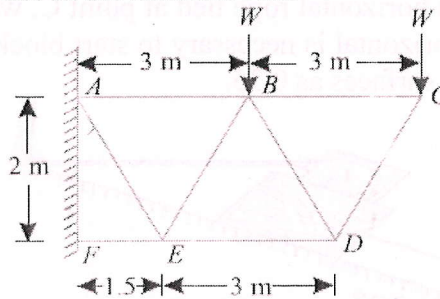
OR

- 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 center of gravity and the base BC. 10M



UNIT-V

- 10 A cantilever truss is loaded as shown in fig. Find the value W, which would produce the force of magnitude 15 kN in the member AB. 10M



OR

- 11 Explain the procedure to find forces in members of truss by using method of sections. 10M

END