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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
 (AUTONOMOUS)
B.Tech I Year I Semester Regular Examinations January 2020
ENGINEERING MECHANICS
 (Common to CE, ME & AGE)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Explain free body diagram with example. **4M**
 b State and prove Lami's theorem. **8M**

OR

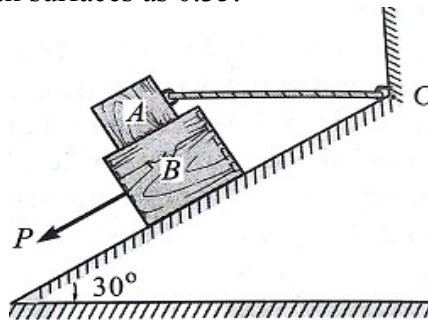
- 2 State and prove Varignon's theorem. **12M**

UNIT-II

- 3 Define the following terms: **12M**
 (i) Limiting Force of Friction
 (ii) Kinetic Friction
 (iii) Co-efficient of Friction
 (iv) Angle of Friction

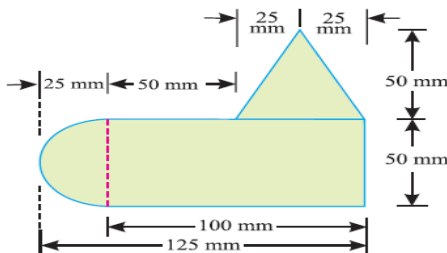
OR

- 4 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. **12M**



UNIT-III

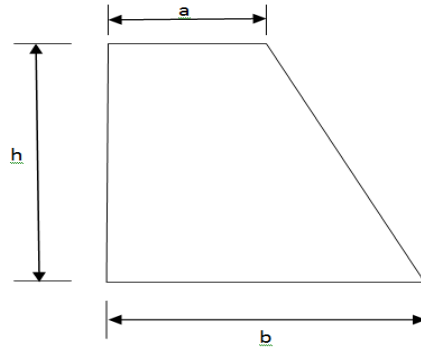
- 5 A uniform lamina shown in Fig. consists of a rectangle, a circle and a triangle. Determine the centre of gravity of the lamina. **12M**



OR

- 6 Find the centroid of the section of a masonry dam as shown in the Fig.

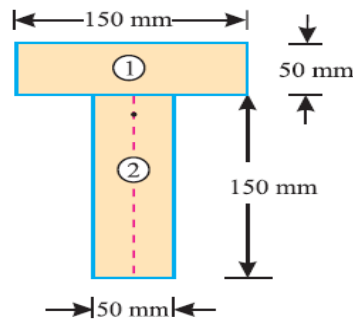
12M



UNIT-IV

- 7 Find the moment of inertia of a T-section with flange as 150 mm × 50 mm and web as 150 mm × 50 mm about X-X and Y-Y axes through the centre of gravity of the section as shown in Fig.

12M



OR

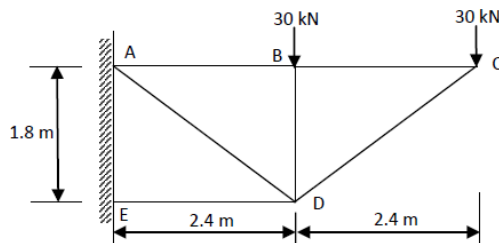
- 8 Prove the parallel axis theorem in the determination of moment of inertia of areas with the help of a neat sketch.

12M

UNIT-V

- 9 Find the forces in the members of a truss as shown in Fig.

12M



OR

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

12M

*** END ***