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SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
I B.Tech I Year I Semester Regular Examinations December 2018
ENGINEERING MECHANICS
(CE,AGE,ME)

Time: 3 hours

Max. Marks: 60

PART-A

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

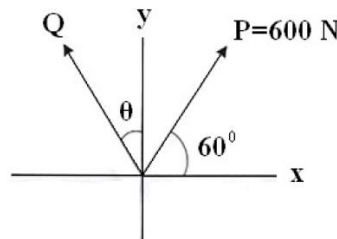
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|----------|--|----|
| 1 | a Classify different types of Force Systems. | 2M |
| | b What is Limiting Friction? | 2M |
| | c Define Centroid. | 2M |
| | d Define Parallel Axis Theorem. | 2M |
| | e Draw Cantilever Truss. | 2M |

PART-B

(Answer all Five Units $5 \times 10 = 50$ Marks)

UNIT-I

- 2** The resultant of two forces P and Q is 1200 N vertical. Determine the force Q and the corresponding angle for the system of forces as shown in Figure. 10M



OR

- 3** The block shown in Figure 1 is acted upon by its weight W, a horizontal force F, and the pressure P exerted by the inclined plane. The resultant R of these forces is parallel to the inclined plane. Determine P and R. Does the block move up or down the incline? 10M

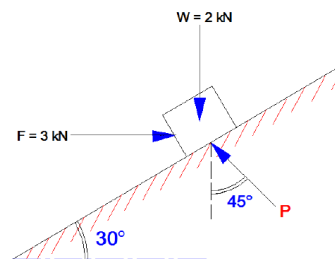


Figure: 1

UNIT-II

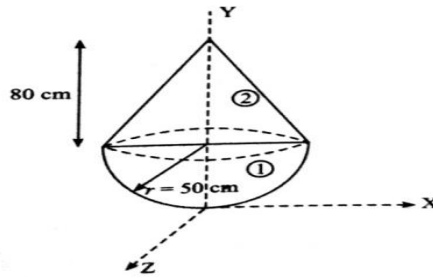
- 4** Write short notes on: (i) Cone friction (ii) Rolling friction (iii) Limiting friction (iv) Condition for self locking in a simple screw jack. 10M

OR

- 5** A solid cylinder of weight 'w' and radius 'r' rolls, down an inclined plane which makes an angle θ with the horizontal axis. Determine the minimum coefficient of friction and the acceleration of the mass center for rolling, without slipping. 10M

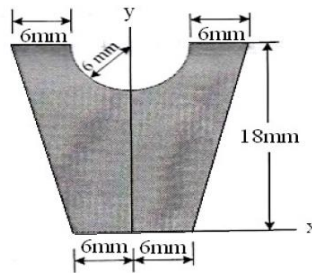
UNIT-III

- 6 Determine the centre of gravity of the following figure. 10M



OR

- 7 Determine the y coordinate of centroid of the shaded area as shown in fig 10M



UNIT-IV

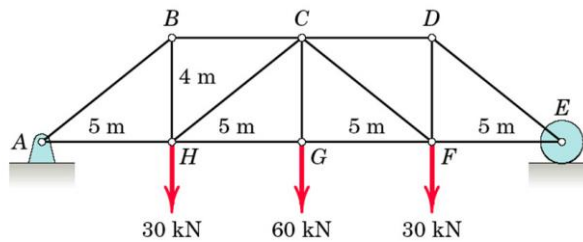
- 8 Explain the terms: 10M
 i. Moment of inertia
 ii. Polar moment of inertia
 iii. Product of inertia.

OR

- 9 Derive the expression for the moment of inertia of a cylinder length 'l', radius 'r' and density 'w' about longitudinal centroidal axis and about the centroidal transverse axis. 10M

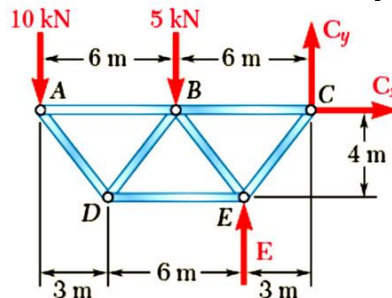
UNIT-V

- 10 Determine the force in each member of the loaded truss by Method of Joints 10M



OR

- 11 Determine the force in each member of the loaded truss by Method of sections 10M



END