

BACHELOR OF TECHNOLOGY (C.B.C.S.) (2021-COURSE)  
 B. Tech. Sem - II CIVIL : WINTER- 2022  
 SUBJECT : STATICS & DYNAMICS

Day : Monday

Time : 10:00 AM-01:00 PM

Date : 28-11-2022

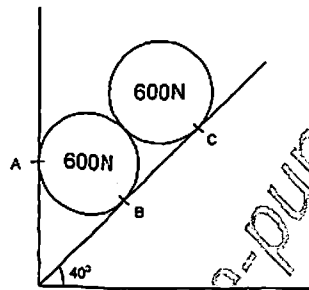
W-24040-2022

Max. Marks : 60

N.B.

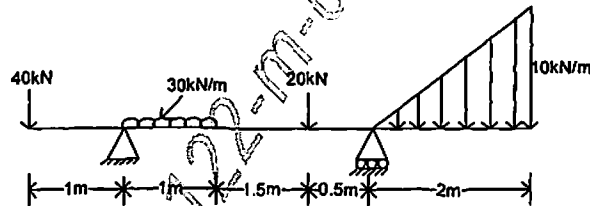
- 1) All questions are **COMPULSORY**.
- 2) Figures to the **RIGHT** indicate **FULL** marks.
- 3) Use of non-programmable calculator is **allowed**.
- 4) Assume suitable data **WHEREVER** necessary.
- 5) Draw neat diagram **WHEREVER** necessary.

Q.1 Two identical rollers are supported by an inclined plane & vertical wall as shown in figure. Assuming smooth surfaces. Find the reactions induced at points of support A, B & C. (10)

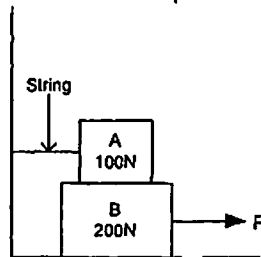


OR

Q.1 Calculate support reactions for the following beam. (10)

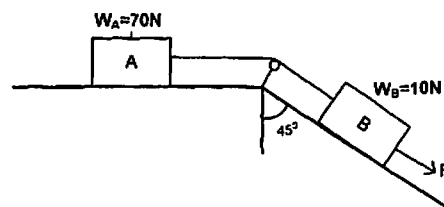


Q.2 Block A is attached to wall using a string and resting on block B. Calculate the force P to just start motion of block B. Take  $\mu=0.25$  for all the surfaces. (10)



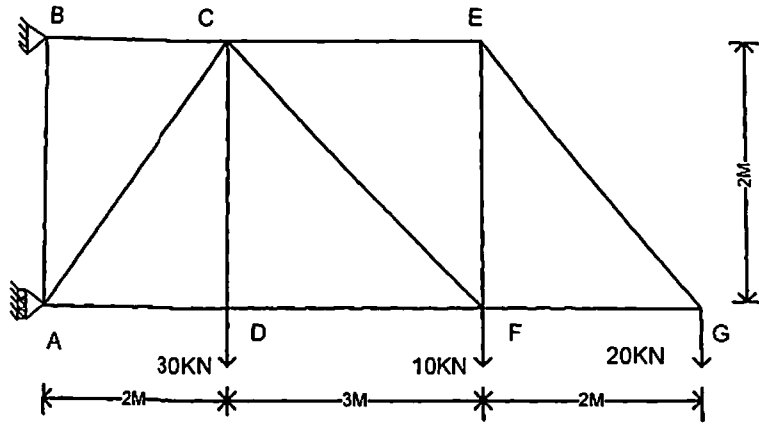
OR

Q.2 Calculate force F to start the motion in downward direction. Take  $\mu=0.25$  for all the surfaces. Assume pulley frictionless (10)



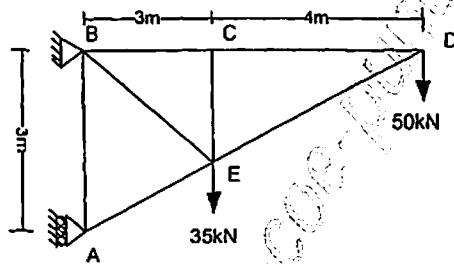
PTO

Q.3 For given truss find the forces in member CE, CF & DF by using method of (10) section.

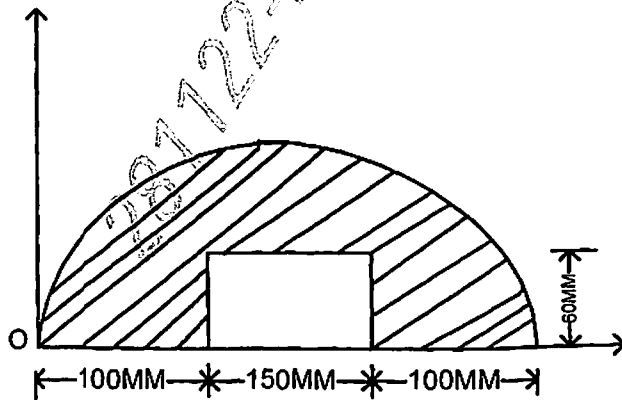


OR

Q.3 Calculate forces in the member using method of joints and tabulate the answer. (10)

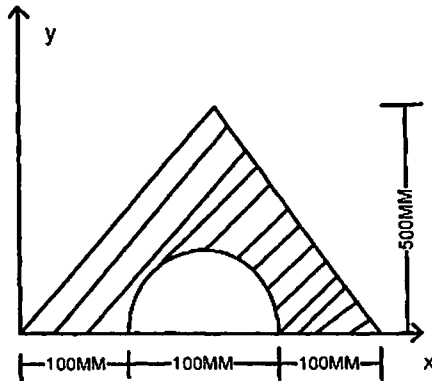


Q.4 Calculate the centroid of the shade area. (10)



OR

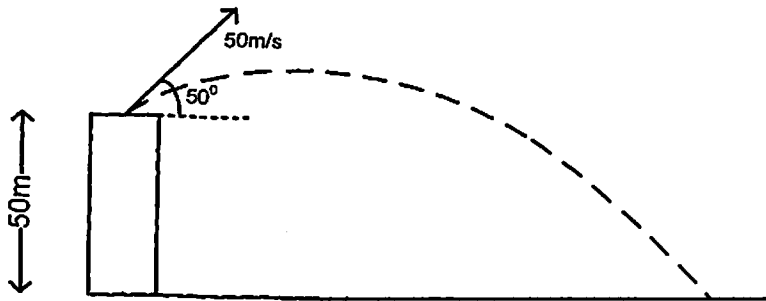
Q.4 Calculate the Moment of Inertia of the shaded area about its centroidal axis X-X (10)



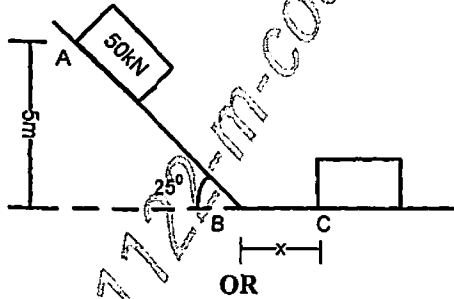
- Q.5 A cyclist is riding west at 30kmph he finds the rain meeting him at an angle of  $50^\circ$  with vertical. When rides at 20 kmph he meets the rain at an angle of  $40^\circ$  with vertical. Find absolute velocity of the rain. (10)

OR

- Q.5 An object is fired from 50m height building as shown in fig. Calculate when and where it will hit the ground. (10)

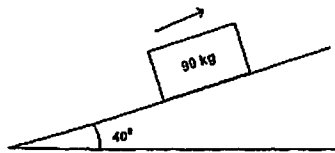


- Q.6 A block weighing 50kN is placed with no initial velocity at the top of an incline as shown in figure.  $\mu_k$  is 0.35. Calculate- (10)
- Calculate the distance "x" block will slide on horizontal plane.
  - Maximum velocity of block.



OR

- Q.6 A 90kg block is projected up an inclined plane of  $40^\circ$  with a velocity of 25m/s.  $\mu=0.45$  (10)
- Calculate the maximum distance the block will move along the inclines plane.
  - Calculate the velocity of the block when it comes back to initial position?



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