



# राष्ट्रीय प्रौद्योगिकी संस्थान गोवा

## NATIONAL INSTITUTE OF TECHNOLOGY GOA

Farmagudi, Ponda, Goa, 403401

Programme Name: B.Tech-Civil Engineering

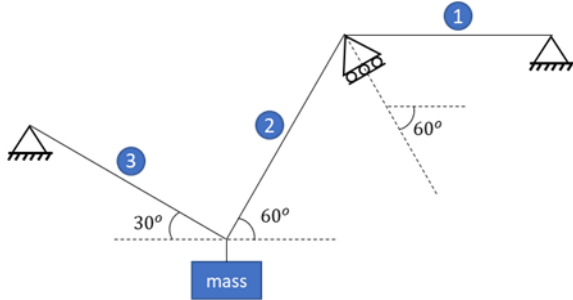
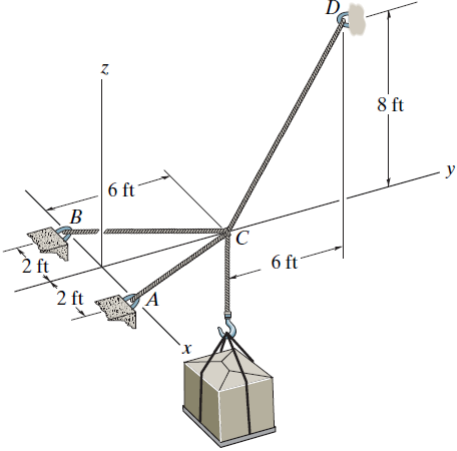
Minor Exam - 1, January-2021

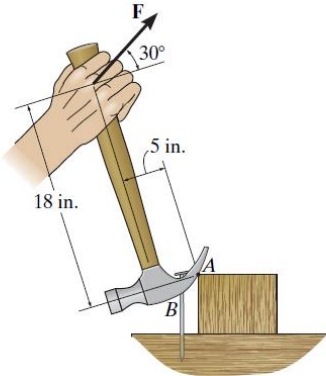
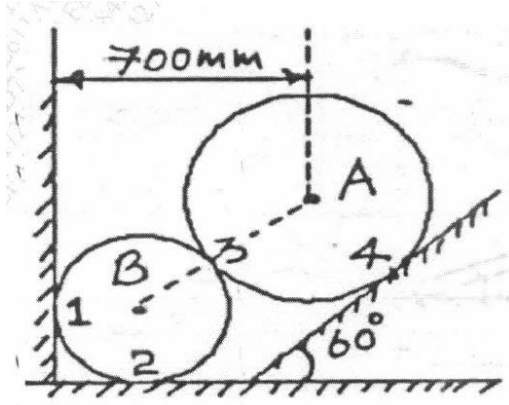
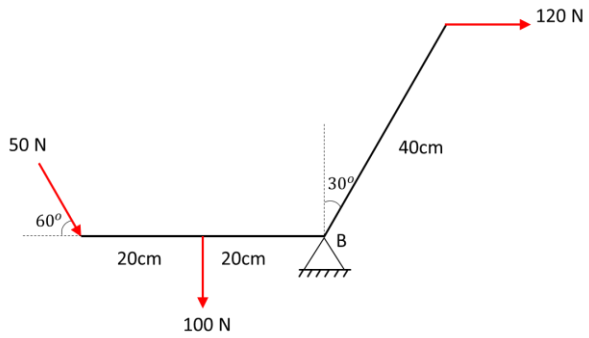
Course Name: Engineering Mechanics  
Date: 27<sup>th</sup> January, 2021  
Duration: 1 Hour

Course Code: ME100  
Time: 5:00 PM – 6:00 PM  
Max. Marks: 30

### ANSWER ALL QUESTIONS

(Assume suitable data wherever applicable;  $g = 9.81 \text{ m/sec}^2$ )

1.	<p>Find mass 'M' required to hold the assembly in the same position as shown in figure 1 in equilibrium. Tension in string 1 is 200 N.</p>  <p style="text-align: center;">Figure 1</p>	3 M
2.	<p>Find tension in all strings to support load of 500 lbs.</p>  <p style="text-align: center;">Figure 2</p>	5 M
3.	<p>In order to pull out the nail at B, the force F exerted on the handle of the hammer must produce a clockwise moment of 500 lb-in about point A. Determine the required magnitude of force F.</p>	2 M

	 <p>Figure 3</p>	
4.	<p>Two spheres A &amp; B of weight 1000 N and 750 N respectively are kept as shown in figure 4. Determine reactions at all contact points 1,2,3,4. Radius of A= 400mm , B = 300mm</p>  <p>Figure 4</p>	8 M
5.	<p>Find the resultant of the forces acting on bell crank lever as shown in figure 5. Also locate its position with respect to hinge 'B'.</p>  <p>Figure 5</p>	4 M
6.	<p>For the system under equilibrium find the tensions in strings AB, AC and AD.</p>	8 M

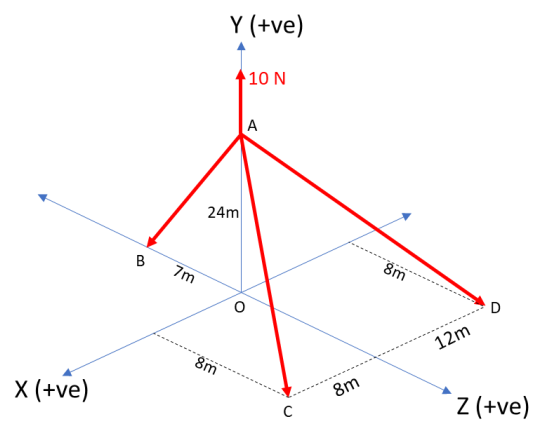


Figure 6