



राष्ट्रीय प्रौद्योगिकी संस्थान गोवा

NATIONAL INSTITUTE OF TECHNOLOGY GOA

Farmagudi, Ponda, Goa, 403401

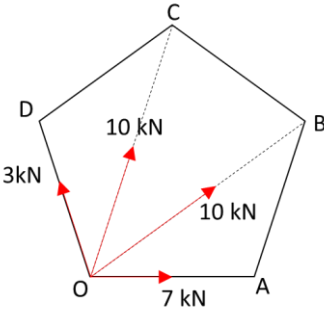
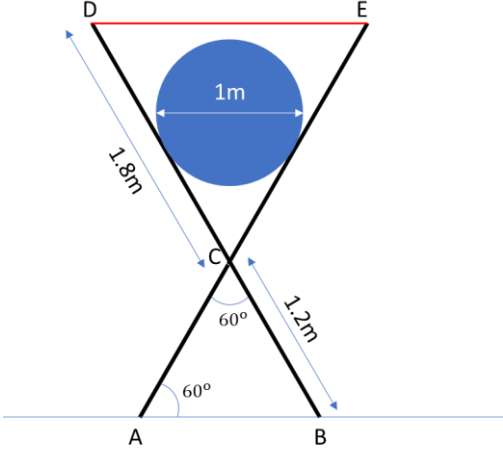
Programme Name: B.Tech-Civil Engineering
Mid Semester Examination, February-2021

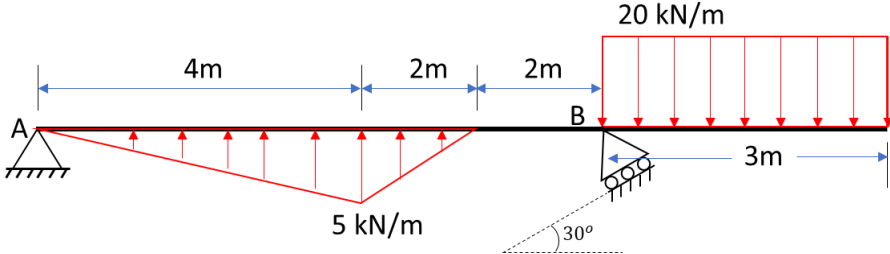
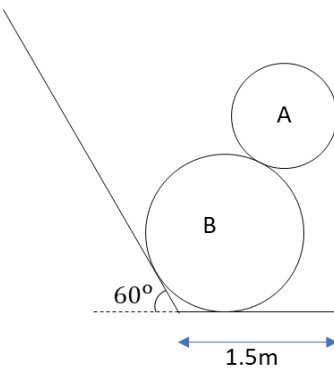
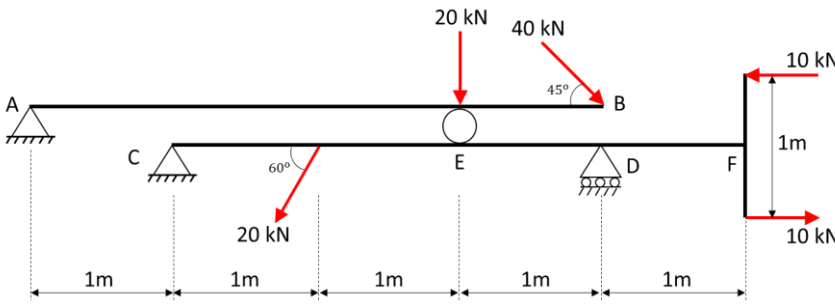
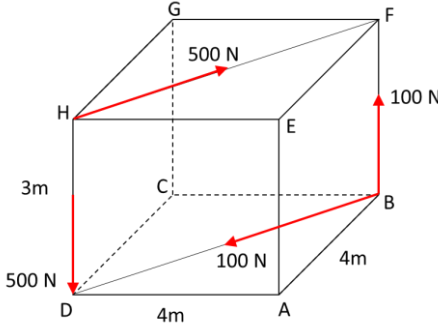
Course Name: Engineering Mechanics
Date: 04th February, 2021
Duration: 1 Hour 30 Minutes

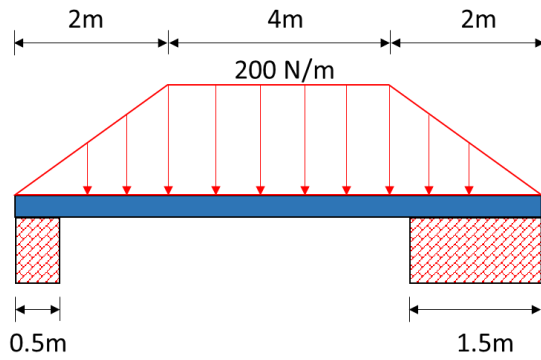
Course Code: ME100
Time: 09:30 AM – 11:00 AM
Max. Marks: 50

ANSWER ALL QUESTIONS

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

1.	<p>Find the resultant of force system as shown in figure 1. (All sides are equal)</p>  <p style="text-align: center;">Figure 1</p>	5 M
2.	<p>A 500 N cylinder of 1m diameter is loaded between the cross pieces (AE & DB) which makes an angle of 60° and are pinned at C (about C rotation is allowed) as shown on figure 2. Determine tension in horizontal rope DE, assuming smooth floor.</p>  <p style="text-align: center;">Figure 2</p>	8 M
3.	<p>Find the reactions at A and B for the structure given in figure 3.</p>	6 M

	 <p style="text-align: center;">Figure 3</p>	
4.	<p>Cylinder A (diameter 1m, weight 20kN) and cylinder B (diameter 1.5m, weight 40kN) are arranged as shown in Figure 4. Find the reactions at all the contact points. All contacts are smooth.</p>  <p style="text-align: center;">Figure 4</p>	6 M
5.	<p>Find the reactions at A, C & D.</p>  <p style="text-align: center;">Figure 5</p>	6 M
6.	<p>Find the resultant of the system of forces as shown in figure 6, and determine its moment about line AC.</p>  <p style="text-align: center;">Figure 6</p>	8 M
7.	<p>For the given simply supported beam, find the reactions at both supports.</p>	6 M

	 <p style="text-align: center;">Figure 7</p>	
8.	Write the statement of Varignon's theorem and prove using derivation.	6 M