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Name of the College (Please tick, symbol is given)	:	COES	<input checked="" type="checkbox"/>	CMES		COLS	
Program/Course	:	B.Tech ET+ LLB IPR					
Semester	:	XII					
Name of the Subject	:	Mechanics of Material					
Subject Code	:	GNEG 253					
Name of Question Paper Setter	:	Nirmalya Tripathi and Avani Kumar Upadhyay					
Employee Code	:	40001123 and 40001345					
Mobile & Extension	:	7895275715 and 8447736508					
Note: Please mention additional Stationery to be provided, during examination such as Table/Graph Sheet etc. else mention "NOT APPLICABLE":							
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Date of Examination	:						
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UNIVERSITY OF PETROLEUM AND ENERGY STUDIES



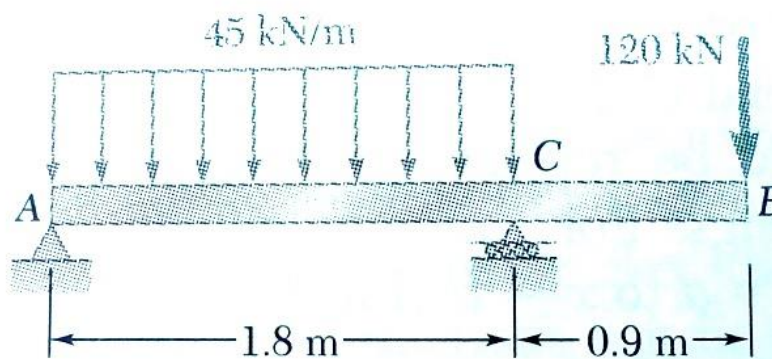
End Semester Examination, April 2017

Program/course: B.Tech ET+ LLB IPR
Subject: Mechanics of Material
Code :GNEG 253
No. of page/s: 4

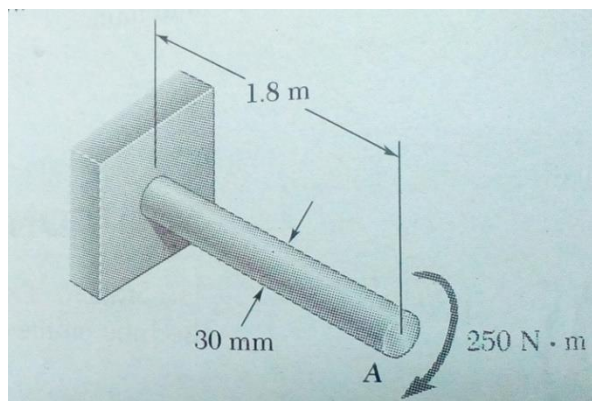
Semester – XII
Max. Marks : 100
Duration : 3 Hrs.

Section-A (Mechanics of Solid)

1. Draw the shear force and bending moment diagram for the beam shown below and determine the maximum absolute value the shear stress and bending moment. **(15)**



2. A polystyrene rod of length 300 mm and diameter 12 mm is subjected to a 3-kN tensile load. Knowing that young's modulus, $E = 3.1 \text{ GPa}$, determine the elongation of the rod and normal stress in the rod. **(15)**
3. For a solid steel shaft shown below ($G = 77 \text{ GPa}$), determine the angle of twist at A. Solve the same assuming the steel shaft is hollow with 30-mm outer diameter and 20 mm inner diameter. **(20)**

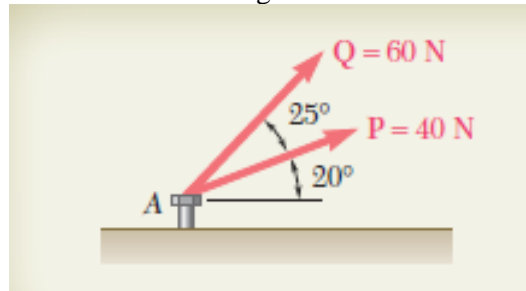


Section-B (Engineering Mechanics)

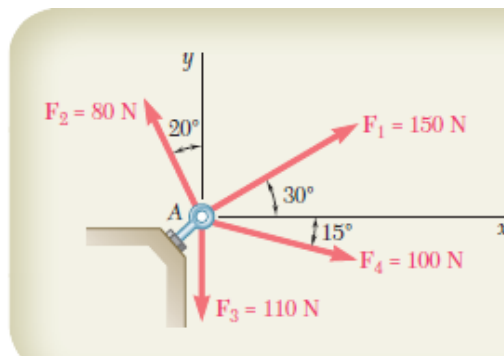
4) Solve all parts

(5X4=20)

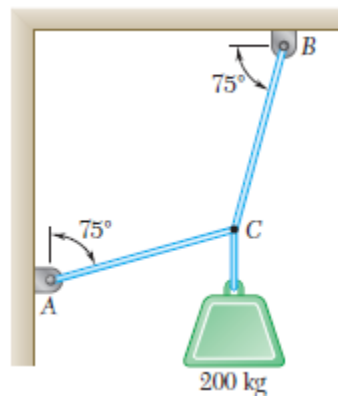
a) Determine the resultant of the two forces acting on the bolt.



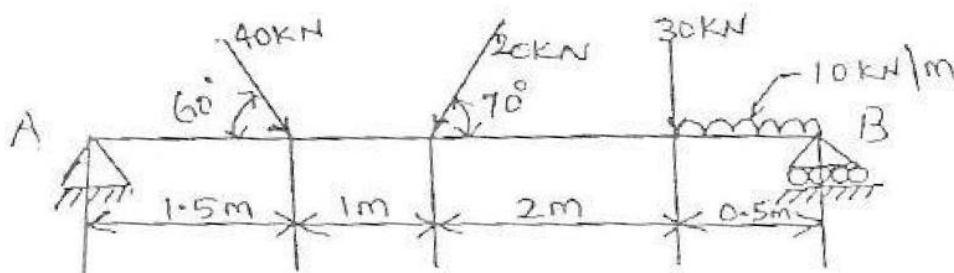
b) Determine the resultant and its angle in the given force system.



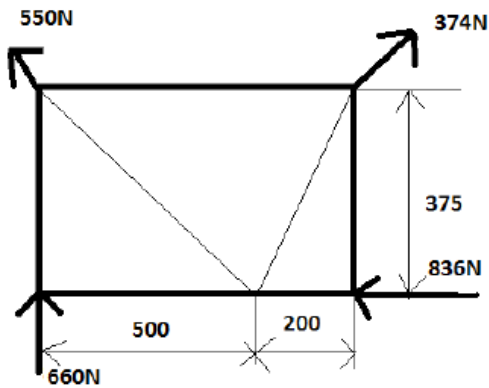
c) Two cables are tied together at C and loaded as shown determine the tension in the cables.



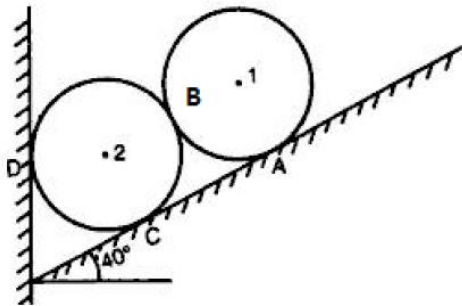
d) Find reactions at points A & B for the beam shown



- 5) Four forces act on a 700mm X 375mm plate as shown in fig. a) Find the resultant of these forces b) Locate the two points where the line of action of the resultant intersects the edge of the plate. (10)



- 6) In the given figure weights and the radius of the given cylinders are 250 N and 150mm respectively. Find the reactions at point A, B,C and D. (10)



- 7) Find the force in the each member of the given truss (10)

