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NMAM INSTITUTE OF TECHNOLOGY, NITTE

(An Autonomous Institution affiliated to VTU, Belagavi)

II Sem B.E. (Credit System) Mid Semester Examinations - II, March 2017

16CV103 – ELEMENTS OF CIVIL ENGINEERING AND ENGINEERING MECHANICS

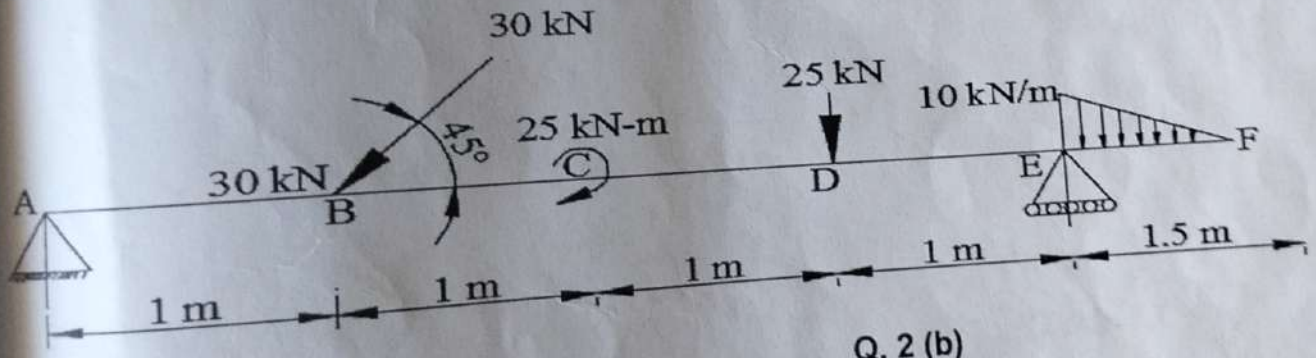
ation: 1 Hour

Max. Marks: 20

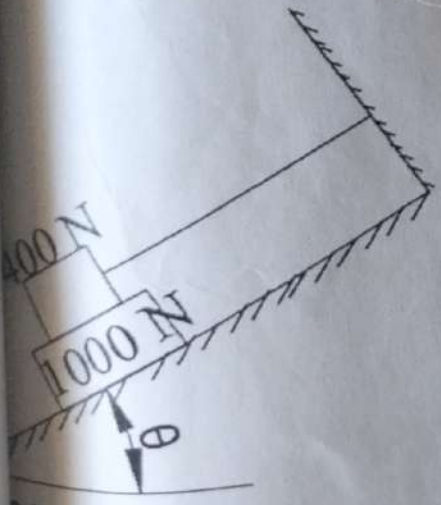
*Note: Answer any **One** full question from **each Unit.***

		Marks	BT*
	Unit – I		
a)	With neat sketches explain any four types of supports and reactions with free body diagram.	4	L*2
b)	A uniform ladder of weight 800 N and of length 7 m rests on a horizontal ground and leans against a smooth vertical wall. The angle made by the ladder with the horizontal is 60°. When a man weighing 600 N stands on the ladder at a distance 4 m from the top of the ladder, the ladder is at the point of sliding. Determine the coefficient of friction between the ladder and the floor.	6	L4
a)	With a neat sketch define (i) Angle of repose (ii) Cone of Friction	4	L1
b)	Determine the reactions at the supports for the beam shown in Fig Q. No. 2 (b).	6	L5
	Unit – II		
a)	From first principle, determine the centroid of a right angle triangle of base 'b' and height 'h'	4	L5
b)	What should be the value of 'θ' in Fig. Q. 3 (b) which will make the motion of 1000 N block down the plane to impend? The coefficient of friction for all contact surfaces is 0.33.	6	L3
a)	With a neat sketches explain any four types of beams.	4	L2
b)	Locate the centroid of the shaded area height as 1000 mm about the axes OX and OY as shown in Fig. Q. 4. (b)	6	L4

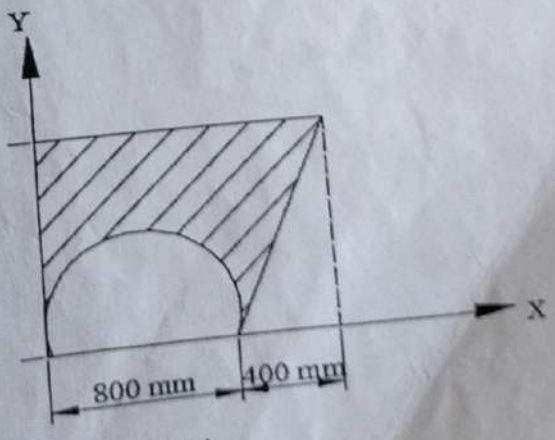
* Bloom's Taxonomy, L* Level



Q. 2 (b)



3 (b)



Q 4 (b)

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II Sem B.E. (Credit System) Mid Semester Examinations - I, February 2017

16CV103 – ELEMENTS OF CIVIL ENGINEERING AND ENGINEERING MECHANICS

Duration: 1 Hour

Max. Marks: 20

*Note: Answer any **One** full question from **each Unit.***

			Marks	BT*
		Unit – I		
1.	a)	Explain the following scopes of civil Engineering, i) Geo-Technical Engineering ii) Structural Engineering	4	L*2
	b)	Determine the magnitude and direction of resultant of a force system as shown in **'Fig. Q1 (b)'**.	6	L4
2.	a)	Explain the law of transmissibility with sketch.	4	L2
	b)	Determine the magnitude of unknown force and resultant force of a system of force as shown in **'Fig. Q 2 (b)'** whose resultant is a horizontal force.	6	L4
		Unit – II		
3.	a)	Define equilibrium and Mention the conditions of equilibrium.	4	L2
	b)	Determine the resultant of force system acting on a plane with respect to point A as shown in **'Fig. Q 3 (b)'**.	6	L4
4.	a)	Discuss the equivalent force couple system with sketch.	4	L2
	b)	Find the reaction at the contact points of two identical cylinders of weight 200N placed as shown in **"Fig. Q 4 (b)'**.	6	L4

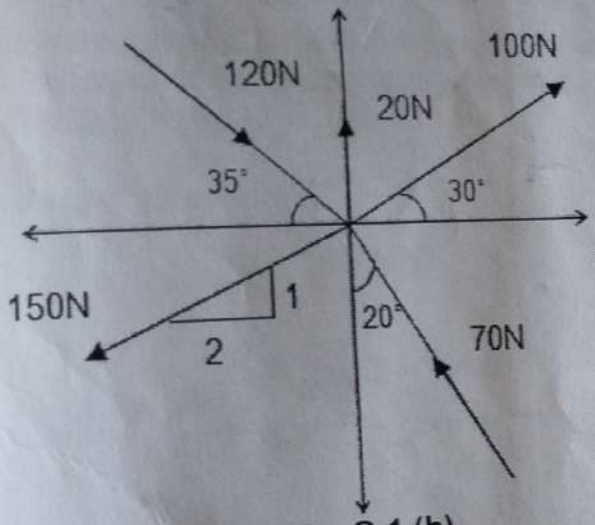

Fig. Q 1 (b)

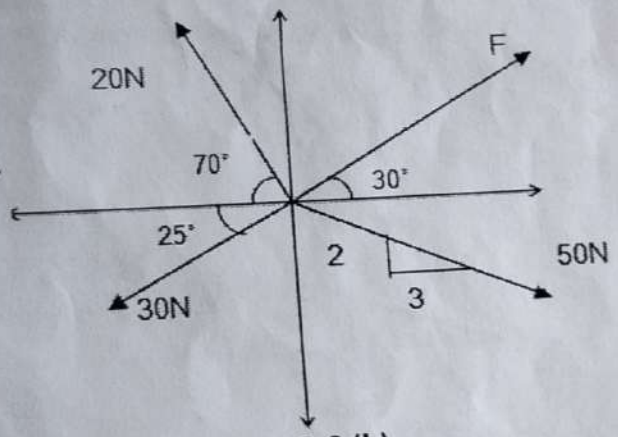

Fig. Q 2 (b)

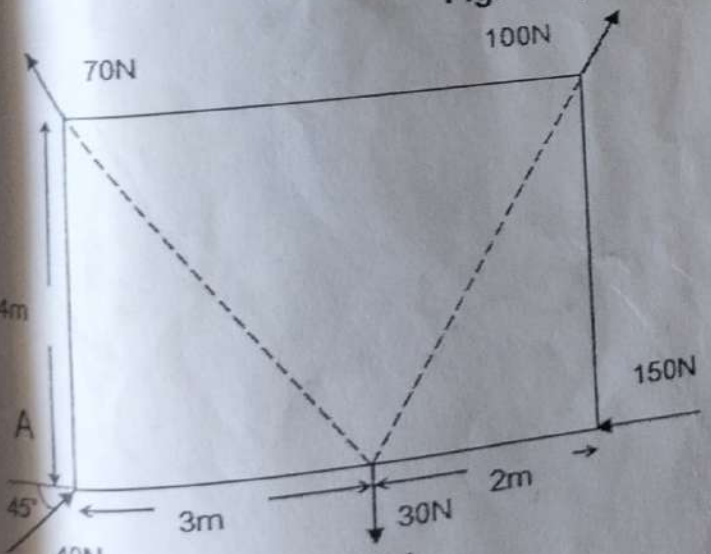

Fig. Q 3 (b)

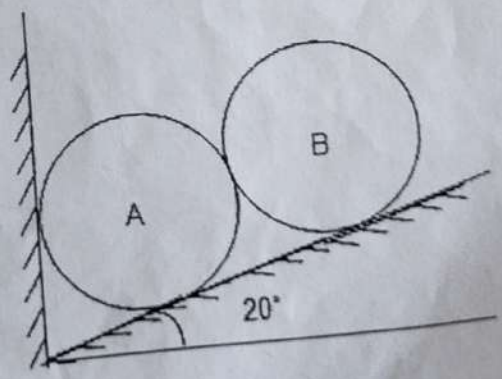

Fig. Q 4(b)

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b) Locate centroid of lamina shown in Fig. 3b with respect to point A.

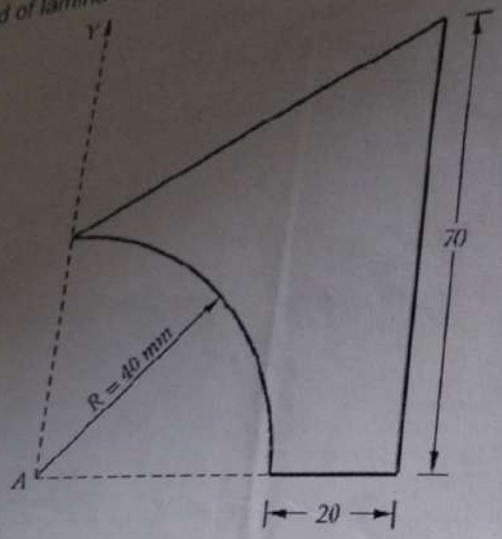
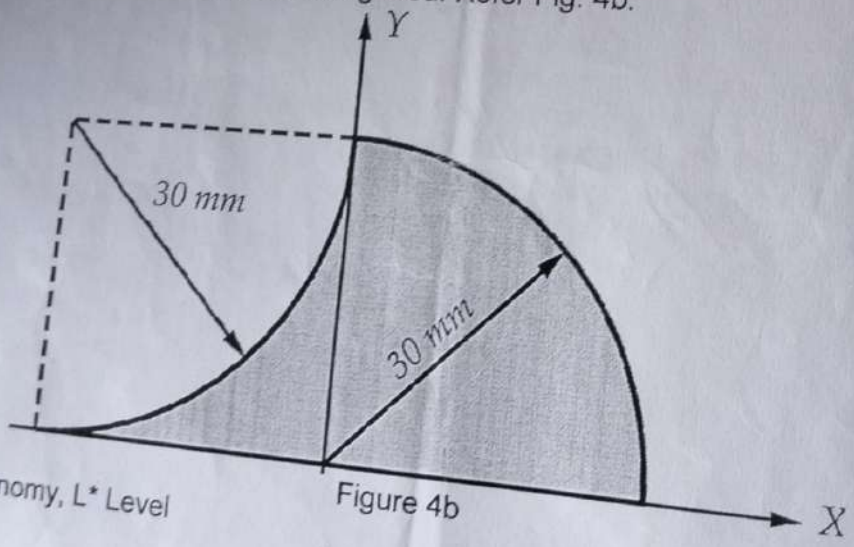


Figure 3b.

4. a) Determine the centroid of a triangular area of base 'b' and height 'h' from first principles

b) Locate the centroids of the following area. Refer Fig. 4b.



Bloom's Taxonomy, L* Level

Figure 4b

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I Sem B.E. (Credit System) Mid Semester Examinations - II, October 2017

17CV103 – ELEMENTS OF CIVIL ENGINEERING AND ENGINEERING MECHANICS

Duration: 1 Hour

Max. Marks: 20

*Note: Answer any **One** full question from **each Unit.***

Unit – I

			Marks	BT*
1.	a)	Mention the laws of static friction.	04	L*2
	b)	For the beam with the loading shown in **Fig. 1b**, determine the reactions at the supports.	06	L4

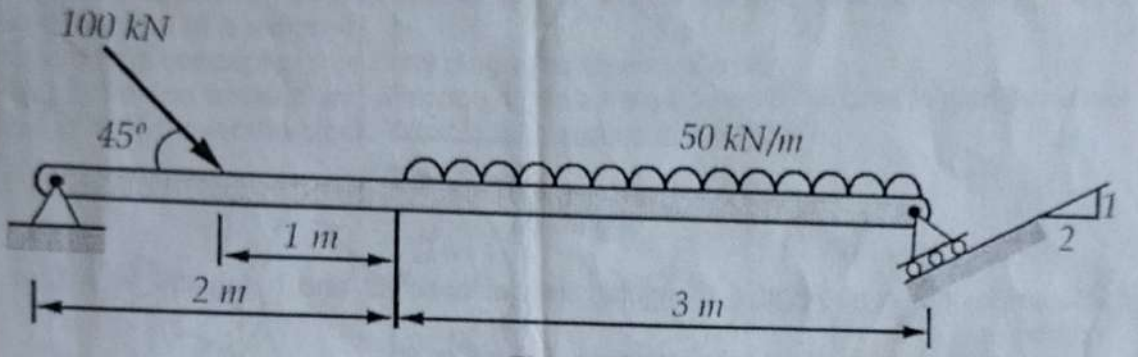

Figure 1b

2.	a)	Explain different types of supports and reactions.	04	L2
	b)	A block of weight 1000 N is placed on a 30° incline with a coefficient of friction is 0.25 as shown in Fig. 2b. Determine the horizontal force to be applied for, when i) The impending motion down the plane and ii) The impending motion up the plane.	06	L5

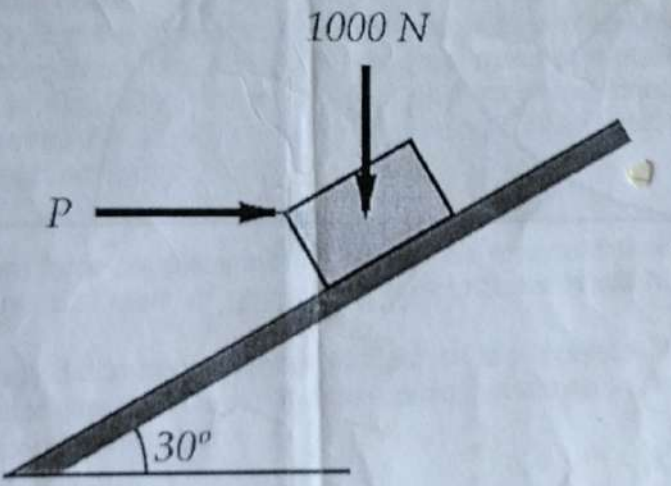

Figure 2b

Unit – II

3.	a)	Determine the centroid of a semi-circular area of radius 'r' from first principles.	04	L3

P.T.O.