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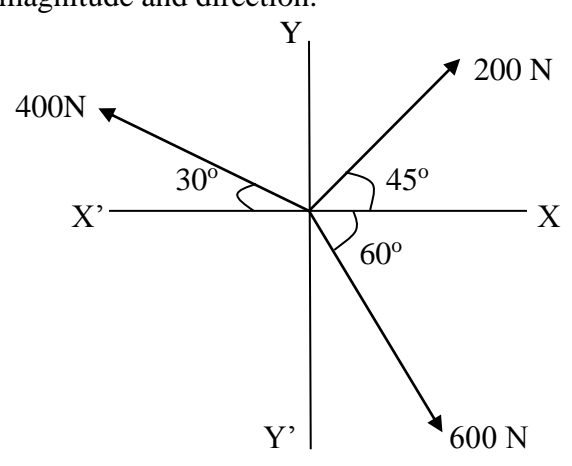
End Semester Examination – Nov/Dec - 2016

Code : **09CE247/12CE203/CE204/CE242**
Sub. Name : **Engineering Mechanics**

Semester : **2016-17 ODD**
Duration : **3 hrs**
Max. marks : **100**

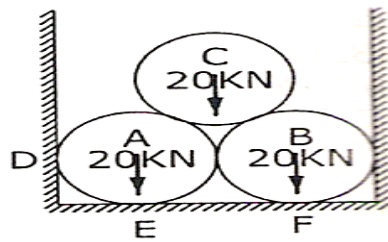
Q. No.	Questions	Marks
PART-A(10X1=10 MARKS)		
1.	Define Resultant force.	(1)
2.	What is the unit of force?	(1)
3.	Distinguish between hinge and roller supports.	(1)
4.	Define moment of a force about a point.	(1)
5.	What is the relationship between kinetic friction and static friction?	(1)
6.	Define Centroid.	(1)
7.	What is rectilinear motion?	(1)
8.	What is friction?	(1)
9.	State Newton's third law of motion?	(1)
10.	Define energy?	(1)

PART B(5 X 3= 15 MARKS)		
11	State Lami's theorem?	(3)
12	Briefly explain the various types of supports.	(3)
13	What is the moment of inertia of a circle and rectangle about the centroidal axes?	(3)
14	Distinguish between Kinetics and Kinematics?	(3)
15	A particle moves along a straight line according to the equation $x = t^3 - 12t^2 + 10$ where x is in meters and t is in seconds. Find the velocity of the particle at which its acceleration is zero.	(3)

PART C(5 X 15= 75 MARKS)		
16.	a.	<p>Three coplanar concurrent forces are acting at a point Shown in Fig. Determine the resultant in magnitude and direction.</p>  <p>(15)</p>

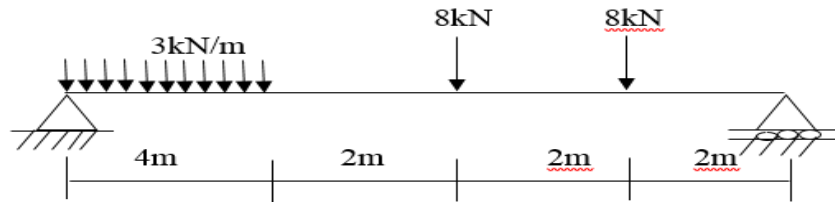
(OR)

17.	a.	<p>Three smooth pipes each weighing 20KN and of diameter 60 cm are to be placed in a rectangular channel with horizontal base as shown in Fig. Calculate the reactions at the points of contact between the pipes and between the channel and the pipes. Take width of channel as 160 cm.</p>
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(15)

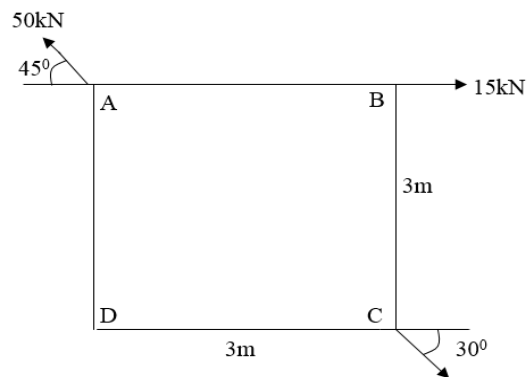
18. a. Determine the support reactions of the beam shown in figure.



(15)

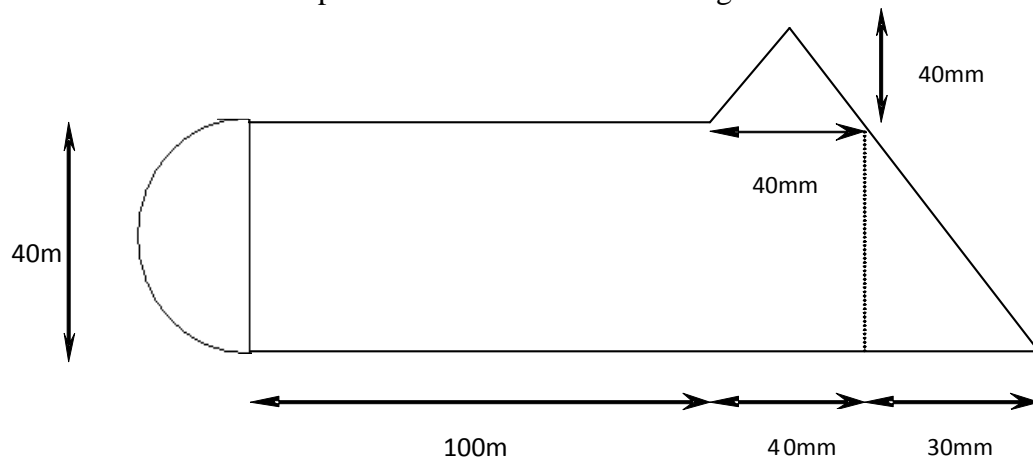
(OR)

19. a. Determine the magnitude and line of action of the resultant of forces shown in figure



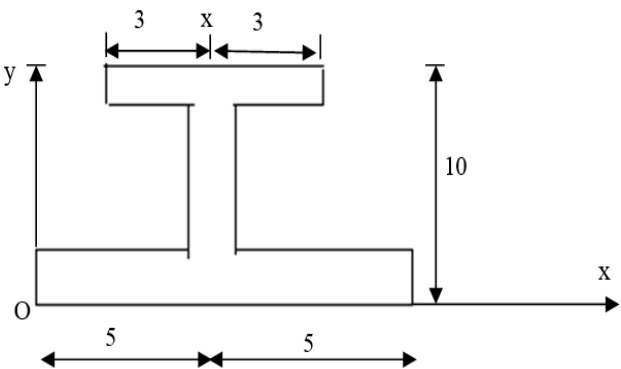
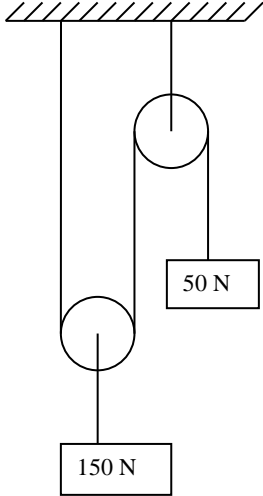
(15)

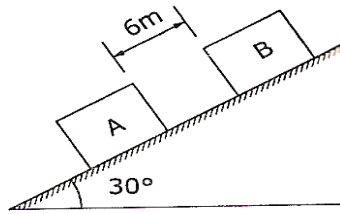
20. a. Locate the centroid of the plane lamina as shown in the figure.



(15)

(OR)

21.	a.	Find I_{xx} , I_{yy} through centroid of the figure with a uniform thickness of 2 cm throughout.	(15)
			
22.	a.	<p>A particle moves along a straight line with variable acceleration. If the displacement is measured in m, and given by the relation of time 't'.</p> $S = 3t^3 + 2t^2 + 7t + 3$ <p>Determine</p> <ol style="list-style-type: none"> the velocity of the particle at start and after 3 seconds. the acceleration of the particle at start and after 3 seconds. 	(15)
(OR)			
23.	a.	A particle is projected with an initial velocity of 12m/s at an angle of ' α ' with the horizontal. After some time, the position of the particle is observed by its x and y distances of 6m and 4m respectively from the point of projection. Find the angle of projection.	(15)
24.	a.	<p>Two blocks of weight 150 N and 50 N are connected by a string a passing over a frictionless pulley as shown in Fig. Determine the velocity of 150 N block after 4 seconds. Also calculate the tension in the string.</p> 	(15)
(OR)			
25.	a.	Two blocks A and B of weight 100 N and 200 N respectively are initially at rest on a 30° inclined plane as shown in Fig. The distance between the blocks is 6 m. The coefficient of friction between the block A and the plane is 0.25 and that between the block B and the plane is 0.15. If they released at the same time, in what time the upper block (B) reaches the lower Block (A).	(15)



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