



Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A

(2 x 5 = 10 Marks)

Q.1. Answer **ANY FIVE** questions

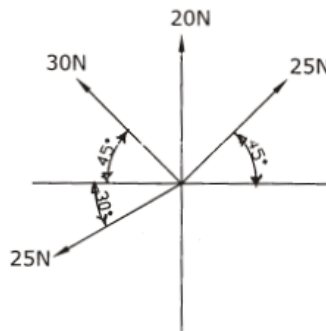
	CO #	Blooms Level
a. Define (a) force and (b) moment of force.	CO1	K1
b. State triangle law of forces.	CO2	K1
c. State the conditions of equilibrium of a body acted by co-planar forces.	CO2	K2
d. Define coefficient of friction.	CO3	K1
e. List out various types of friction.	CO3	K2
f. Define Centroid and Centre of gravity.	CO4	K2

PART – B

(15 x 4 = 60 Marks)

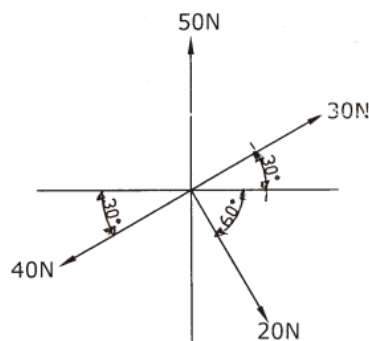
Answer **ANY TWO (a, b OR c, d)** from all the questions below

	Marks	CO #	Blooms Level
2. a. Define and prove law of triangle.	5	CO1	K1
b. Determine the magnitude and direction of the resultant of the following system of forces :	10	CO2	K3



(OR)

c. What do you understand by equilibrium? State the conditions for equilibrium.	5	CO1	K1
d. Determine the magnitude and direction of the resultant of the following system of forces:	10	CO2	K3



3.a. Two forces 30 N and 40 N act at a point 'O'. The included angle between them is 60 degree. Find the magnitude and direction of the resultant force.	8	CO2	K3
--	---	-----	----

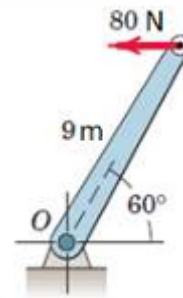
b. State and explain the principle of transmissibility with example. 7 CO2 K2

(OR)

c. Two forces of 400 N and 600 N act at an angle 60 degree to each other 8 CO2 K3
 Determine the resultant in magnitude and direction

d. Define and proof Lami's theorem. 7 CO2 K2

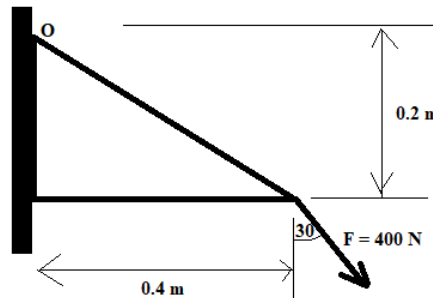
4.a. Replace the horizontal 80 N force acting on the lever by an 8 CO3 K4
 equivalent system consisting of a force at O and a couple.



b. Differentiate between Moment and couple with examples. 7 CO3 K2

(OR)

c. Force F acts at the end of the angle bracket shown in figure. Determine the 8 CO3 K4
 moment of the force about the point 'O'.



d. Why couple is required. Illustrate briefly about the couple with suitable 7 CO3 K2
 example.

5.a. A body of weight 150 N is placed on a horizontal plane. It is pulled by a 7 CO3 K4
 horizontal force of 75 N just causes the body to slide over the horizontal plane.
 Find the coefficient of friction.

b. Find the centroid of given lamina (Fig. A.) 8 CO4 K3

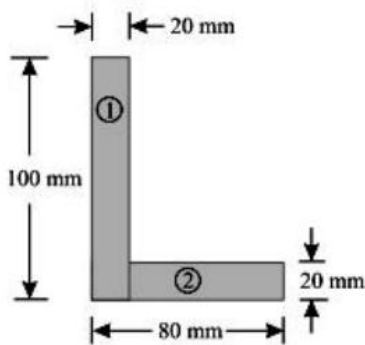


Fig. A.

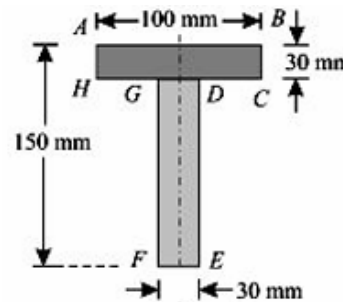
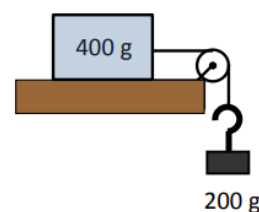


Fig. B.

(OR)

c. Find the centroid of given lamina. (Fig. B.) 8 CO4 K3

d. A 400-gram package lying on a horizontal surface is attached to 7 CO3 K4
 a horizontal string which passes over a smooth pulley. When a mass of 200 grams is attached to the other end of the string, the package is on the point of moving. Find μ , the coefficient of friction.



--- End of Paper ---