Roll No											

PRESIDENCY UNIVERSITY
BENGALURU

SET A

SCHOOL OF ENGINEERING
END TERM EXAMINATION - JAN 2024

Semester : Semester I - 2023
Course Code : CIV1003
Course Name : Elements of Engineering Mechanics
Program : B.Tech.

Date : 18-JAN-2024
Time : 9:30AM - 12:30 PM
Max Marks : 100
Weightage : 50%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Question paper consists of 3 parts.
(iii) Scientific and non-programmable calculator are permitted.
(iv) Do not write any information on the question paper other than Roll Number.

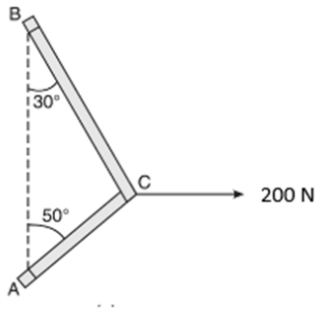
PART A

ANSWER ALL THE QUESTIONS **(3Q X 5M = 15M)**

1. Define a Moment and a Couple. Write their properties.

(CO1) [Knowledge]

2. For the structure shown in the figure, determine the forces induced in the members AC and BC.



(CO2) [Knowledge]

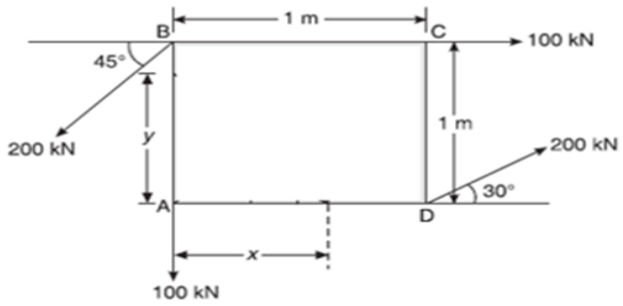
3. State friction and explain the various types of friction.

(CO3) [Knowledge]

PART B

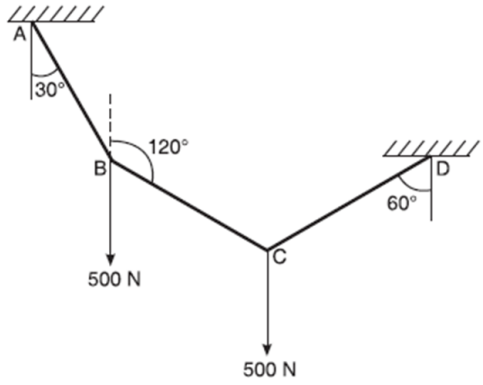
ANSWER ALL THE QUESTIONS **(3Q X 15M = 45M)**

4. Compute the magnitude, direction and line of action of the resultant of a rigid plate ABCD with reference to the point A.



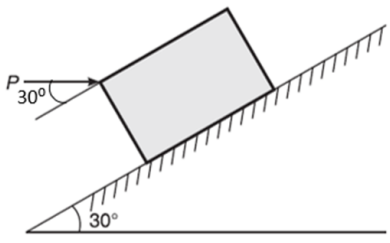
(CO1) [Comprehension]

5. A string ABCD attached to two fixed points A and D has two equal weights 500 N attached to it at B and C. The weights rest with portions AB and CD inclined at angles of 30° and 60° respectively with the vertical. Find the tensions in the portions AB, BC, and CD of the string. The inclination of BC with vertical is 120°.



(CO2) [Comprehension]

6. A small block of weight 1000 N as shown in figure, is placed on a 30° inclined plane with μ = 0.25. Determine the horizontal force to be applied for:
(i) Impending motion down the plane
(ii) Impending motion up the plane.

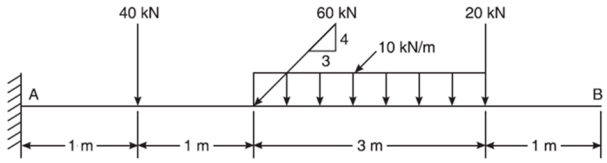


(CO3) [Comprehension]

PART C

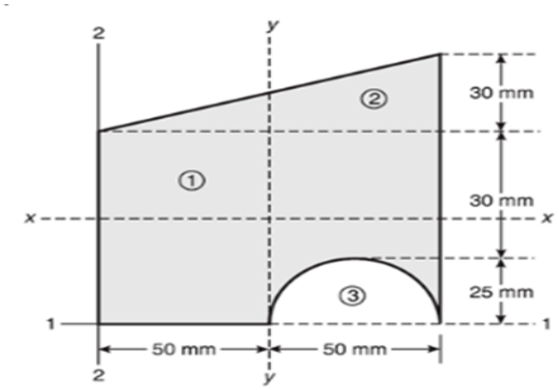
ANSWER ALL THE QUESTIONS **(2Q X 20M = 40M)**

7. Determine the support reactions for the cantilever beam loaded as shown in figure.



(CO2) [Application]

8. Determine the Centroid of the shaded area for the combination of geometric shapes as shown in the figure.



(CO3) [Application]