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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

MID TERM EXAMINATION

Winter Semester: 2021 - 22

Course Code: CIV 1003

Course Name: Elements of Engineering Mechanics

Program & Sem: B. Tech. Civil – II semester

Date: 12/05/2022

Time: 10:00 AM – 11:30 AM

Max Marks: 50

Weightage: 25%

Instructions:

(i) Read the all questions carefully and answer accordingly.

Part A

Answer all the Questions. Each question carries FOUR marks.

(4Qx 4M= 16M)

- Define the following terms. (C.O.No.1) [Knowledge]
a) Statics b) Dynamics c) Rigid Body
- Define resultant force and name the methods to find out the resultant force. (C.O.No.1) [Knowledge]
- Define a) Composition forces b) Resolution of force. c) Moment of Force (C.O.No.1) [Knowledge]
- What is the statement of Varignon's theorem illustrate with example. (C.O.No.1) [Knowledge]

Part B

Answer all the Questions. Each question carries 20 marks.

(2Qx10M=20M)

- Find the magnitude and direction of the resultant force for the system shown in the fig -1 and also indicate the equilibrant force. (C.O.No.2) [Comprehension]

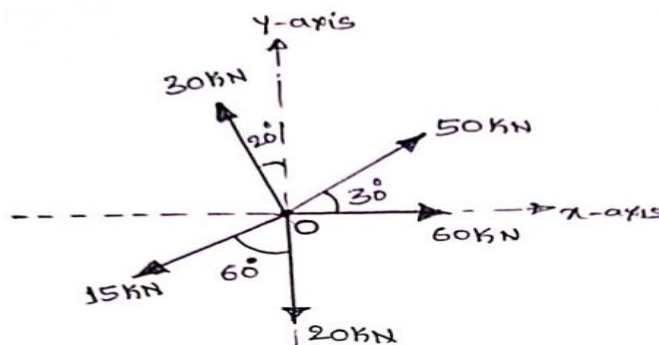


Fig - 1

6. Find the moment of all the force shown in the fig – 2 about A, B, C and D
(C.O.No.2) [Comprehension]

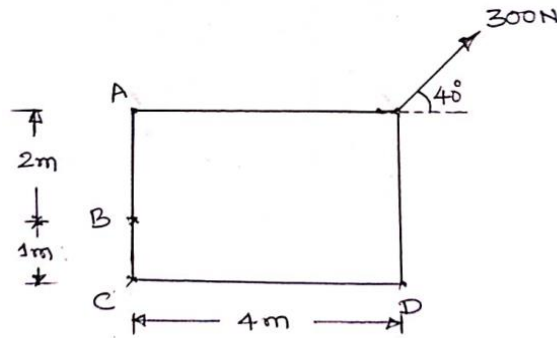


Fig - 2

Part C [Problem Solving Questions]

Answer all the Questions. Question carries FOURTEEN marks. (1Qx14M=14M)

7. Determine the magnitude, direction and point of application of the resultant force with respect A for the system shown in the fig - 3
(C.O.No.2) [Comprehension]

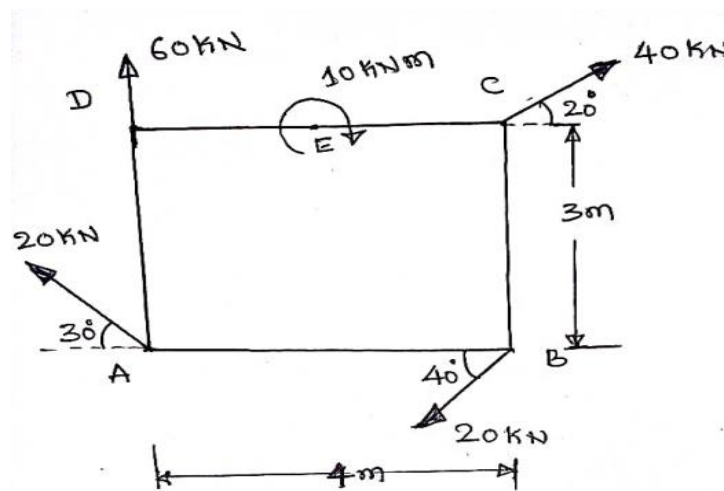


Fig - 3



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Date: 12/05/2022

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Max Marks: 50

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Instructions:

(i) Read the all questions carefully and answer accordingly.

Part A

Answer all the Questions. Each question carries FOUR marks. (4Qx 4M= 16M)

- 1. Define the following terms. (C.O.No.1) [Knowledge]
a) Statics b) Dynamics c) Rigid Body
- 2. Define resultant force and name the methods to find out the resultant force. (C.O.No.1) [Knowledge]
- 3. Define a) Composition forces b) Resolution of force. c) Moment of Force (C.O.No.1) [Knowledge]
- 4. What is the statement of Varignon's theorem illustrate with example. (C.O.No.1) [Knowledge]

Part B

Answer all the Questions. Each question carries 20 marks. (2Qx10M=20M)

- 5. Find the magnitude and direction of the resultant force for the system shown in the fig -1 and also indicate the equilibrant force. (C.O.No.2) [Comprehension]

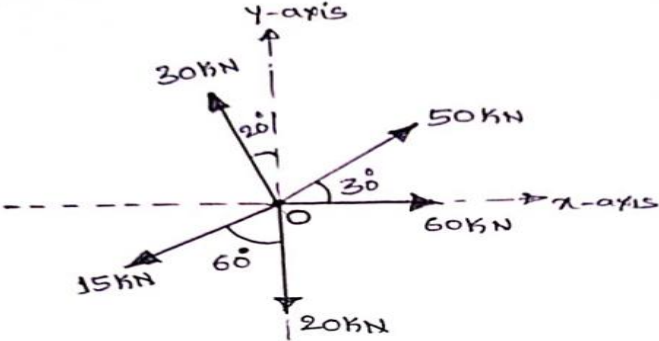


Fig - 1

6. Find the moment of all the force shown in the fig – 2 about A, B, C and D
(C.O.No.2) [Comprehension]

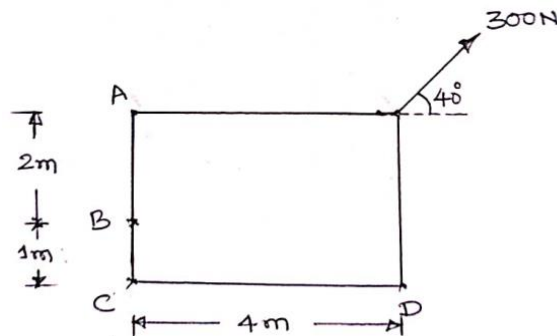


Fig - 2

Part C [Problem Solving Questions]

Answer all the Questions. Question carries FOURTEEN marks. (1Qx14M=14M)

7. Determine the magnitude, direction and point of application of the resultant force with respect A for the system shown in the fig - 3
(C.O.No.2) [Comprehension]

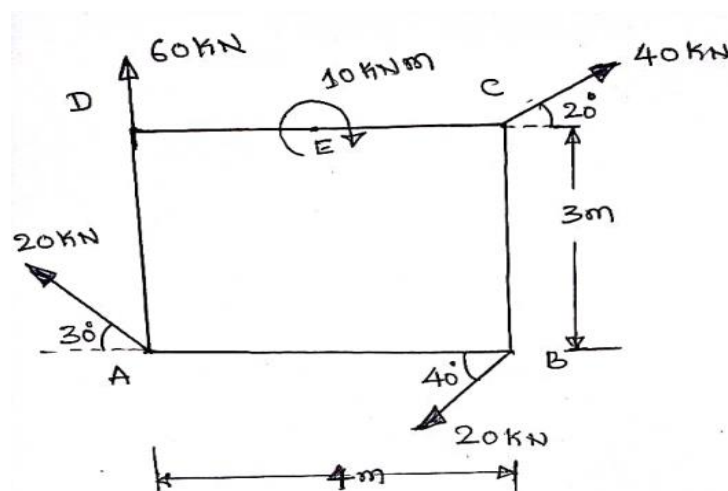


Fig - 3



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**PRESIDENCY UNIVERSITY
BENGALURU**

SCHOOL OF ENGINEERING

END TERM EXAMINATION

Winter Semester: 2021 - 22

Course Code: CIV1003

Course Name: Elements of Engineering Mechanics

Program & Sem: B. Tech. Civil – II Sem

Date: 8th July 2022

Time: 01.00 PM to 04.00 PM

Max Marks: 100

Weightage: 50%

Instructions:

- (i) *Read the all questions carefully and answer accordingly.*

Part A [Memory Recall Questions]

Answer all the Questions. Each question carries 02 marks.

(10Qx 2M= 20M)

- The line along which the force is acting on a body is called _____ of force.
a) Magnitude b) Line of action c) Point of application d) None of the above
- The process of splitting up of a given force is known as _____.
a) Combining of force b) Resolution of force c) Resultant force d) None of the above
- If a force 'F' makes an angle θ with respect to x axis, then component of a force along x axis is _____.
a) $F \cos\theta$ b) $F \sin\theta$ c) $F \tan\theta$ d) None of the above
- If all the forces are acting at point, then the system of force is called _____.
a) Non Concurrent b) Concurrent c) Collinear d) None of the above.
- The available number of condition of equilibrium for concurrent system _____.
a) 3 b) 2 c) 4 d) 5
- The number reaction components for roller support is _____.
a) 3 b) 1 c) 2 d) 4
- The number of reaction components for fixed support are _____.
a) 1 b) 3 c) 4 d) None of the above
- The moment of inertia of a rectangular section having width 'b' and depth 'd' about its horizontal centroidal axis is _____.
a) $\frac{b d^3}{12}$ b) $\frac{b d^3}{24}$ c) $\frac{b d^3}{36}$ d) None of the above.
- The moment of inertia is also called _____.
a) First moment of area b) Second moment of area c) Third moment of area d) None of the above
- If intensity of load on each unit length of the beam is varies uniformly then the load is said to be _____.

- a) Uniformly distributed load b) Uniformly varying load c) Point load d) None of the above

(C.O.No.1) [Knowledge]

Part B [Thought Provoking Questions]

Answer all the Questions. Each question carries 10 marks.

(5Qx10M=50M)

11. Find the magnitude and direction of the resultant force for the system shown in the fig -1

(C.O.No.2) [Comprehension]

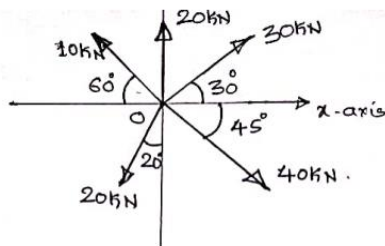


Fig -1

12. Compute the tensile forces induced in all the segments of cable when two loads are suspended at B and C as shown in fig – 2.

(C.O.No.2) [Comprehension]

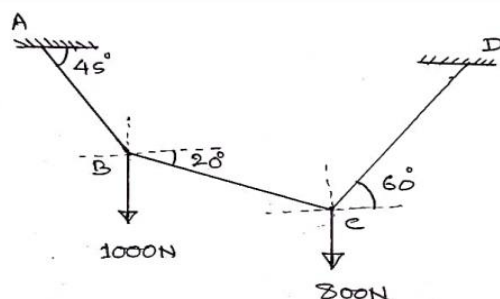


Fig - 2

13. Two spheres each of radius 100mm and weight 10 KN are placed in a rectangular box as shown in the fig – 3. Calculate reactions at all the point of contacts.

(C.O.No.2) [Comprehension]

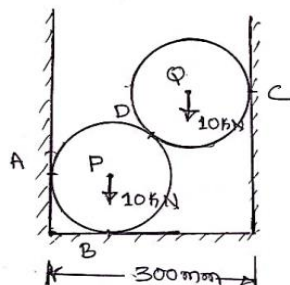


Fig - 3

14. Locate the centroid of a lamina as shown in fig – 4 and draw the centroidal axis.

(C.O.No.2) [Comprehension]

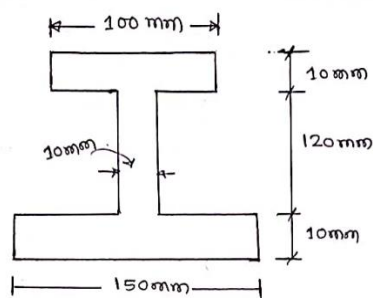


Fig - 4

15. Locate the centroid of a lamina as shown in the fig - 5 and draw the centroidal axis.
(C.O.No.2) [Comprehension]

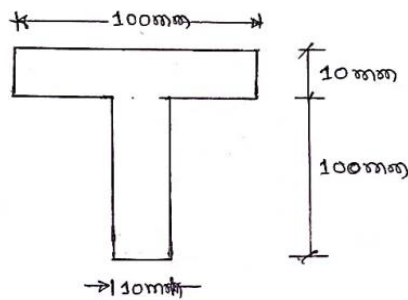


Fig - 5

Part C [Problem Solving Questions]

Answer both the Questions. Each question carries 15 marks. (2Qx15M=30M)

16. Calculate the support reactions for a simply supported beam loaded as shown in the fig – 6.
(C.O.No. 3) [Comprehension]

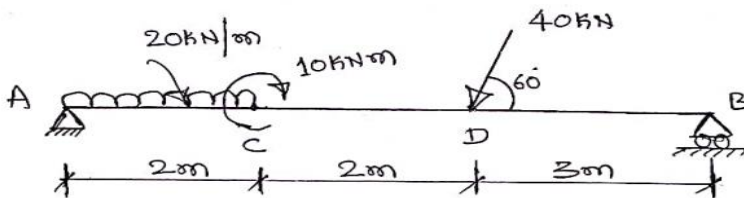


Fig - 6

17. Calculate the moment of inertia about its vertical and horizontal centroidal axis of a plane lamina as shown in fig – 7.
(C.O.No. 3) [Comprehension]

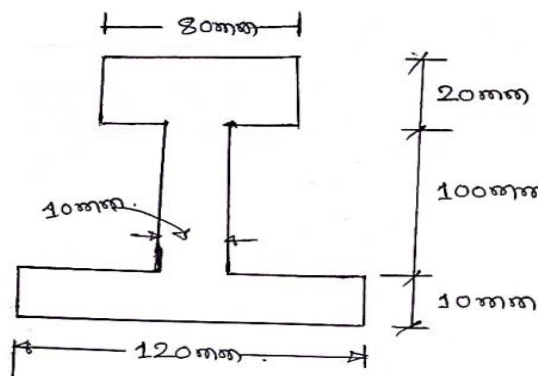


Fig - 7