



FIRST MID TERM EXAM

Name (in Arabic) :

Student No.:

Section / Instructor:

Q.	Max. Marks	Obtained
1	10	
2	10	
3	10	
Total	30	

Question # 1 (10 points)

(a) – (4 points)

i) Moment produced by a force about an axis intersecting the line of action of the force is

- a) *Positive* b) *Negative* c) *Zero*

ii) For a coplanar and collinear force system, number of independent equilibrium equations is

- a) *One* b) *Two* c) *Three*

iii) The forces whose lines of action meet at a common point are called forces.

- a) *Parallel* b) *Collinear* c) *Concurrent*

iv) The magnitude of projection of force **F** on **line AB** is equal to

(b) – (2 points)

The tension force in the cable is **100N** as shown in Figure 1, determine force **T**.

Solution:

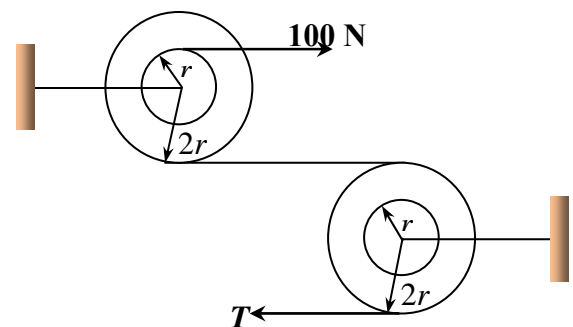


Figure 1

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(c) – (4 points)

Calculate the magnitude of the force supported by the pin at **B** and the roller at **A** for the bell crank loaded as shown in Figure 2.

Solution:

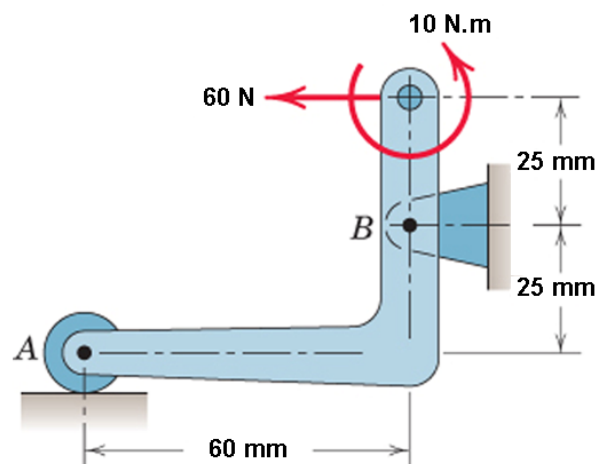


Figure 2

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Question # 2 (10 points)

For the loaded system shown in Figure 3:

- Replace the three forces and a couple by a single force \mathbf{R} and moment \mathbf{M} about point \mathbf{O} .
- Determine the direction of \mathbf{R} .
- Sketch the resultant force \mathbf{R} that represents the force-couple system alone and find its intersection with the x -axis.

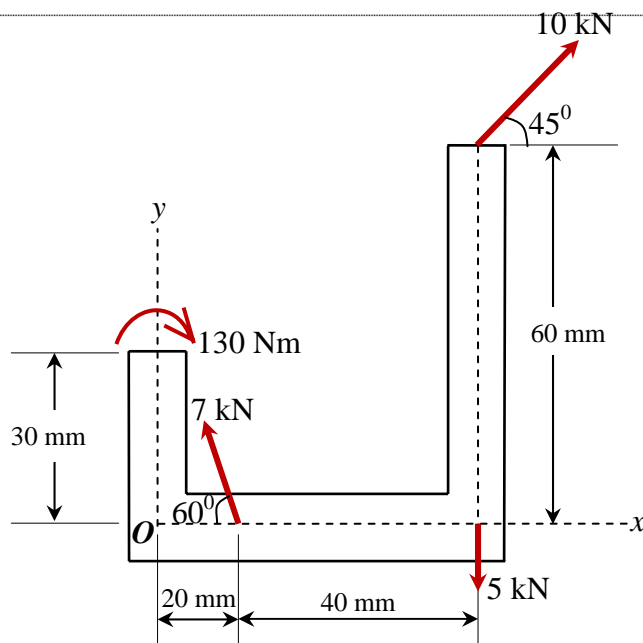


Figure 3

Solution

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Question # 3 (10 points)

For the force system shown in Fig. 4, determine the following:

- (i) the moment about point **B** (M_B).
- (ii) the moment about *line CD* (M_{CD}).

Note that point **A** lies in the y-z plane.

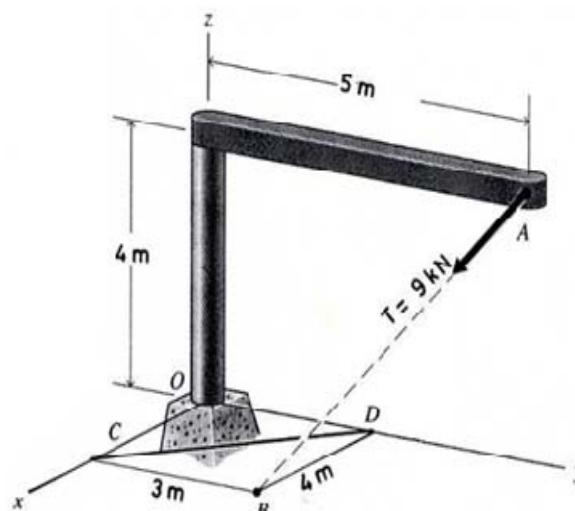


Figure 4

Solution: