



These problems address topics from the NCEES FE Civil CBT Exam Specifications at <https://ncees.org/wp-content/uploads/FE-Civil-CBT-specs-1.pdf>, see below.

## **FE Civil Review 2022**

### **Statics**

*NCEES Fundamentals of Engineering (FE)  
CIVIL CBT Exam Specifications*

*Effective Beginning with the July 2020 Examinations*



Knowledge	Number of Questions
<b>4. Statics</b> A. Resultants of force systems B. Equivalent force systems C. Equilibrium of rigid bodies D. Frames and trusses E. Centroid of area F. Area moments of inertia G. Static friction	<b>8-12</b>

#### Notes

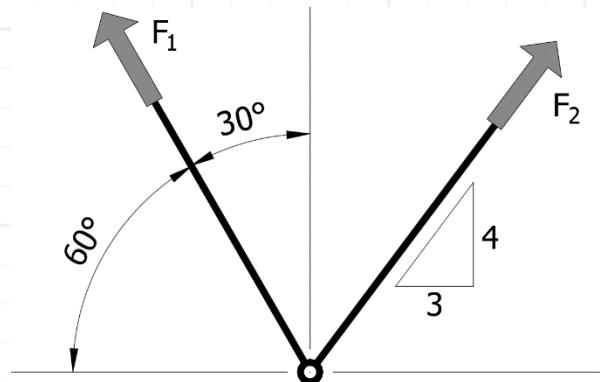
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**A. Resultant of force systems**

**Question 1:** Forces  $F_1 = 220$  kN and  $F_2 = 240$  kN act at the angles given below. When these forces are added together, the magnitude of their resultant (not shown) is most nearly:

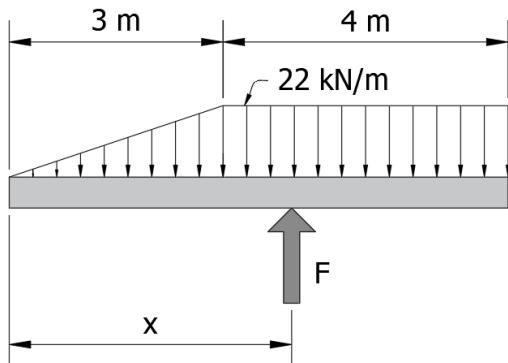


- A. 190 kN
- B. 360 kN
- C. 380 kN
- D. 440 kN



**B. Equivalent force systems**

**Question 2:** The magnitude of force  $F$  at distance  $x$  as shown below that will cause vertical and rotational equilibrium for the system is most nearly:



A.  $F = 121 \text{ kN}$ ,  $x = 3.9 \text{ m}$

B.  $F = 121 \text{ kN}$ ,  $x = 4.2 \text{ m}$

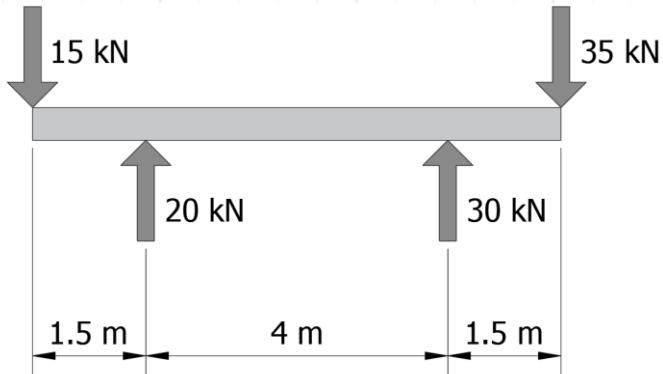
C.  $F = 154 \text{ kN}$ ,  $x = 3.9 \text{ m}$

D.  $F = 154 \text{ kN}$ ,  $x = 4.2 \text{ m}$



**B. Equivalent force systems**

**Question 3:** The forces shown below can be replaced by a single equivalent moment. The magnitude of an equivalent moment is most nearly:

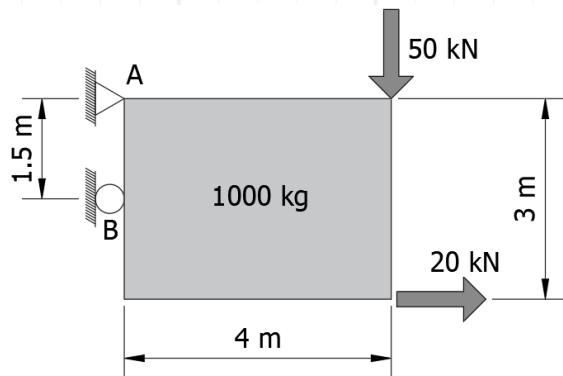


- A. 50 kN-m
- B. 110 kN-m
- C. 380 kN-m
- D. 440 kN-m



**C. Equilibrium of rigid bodies**

**Question 4:** A rigid body with mass of 1000 kg and applied loads is shown below. The magnitude of the resultant force at support A to maintain equilibrium of the rigid body below is most nearly:

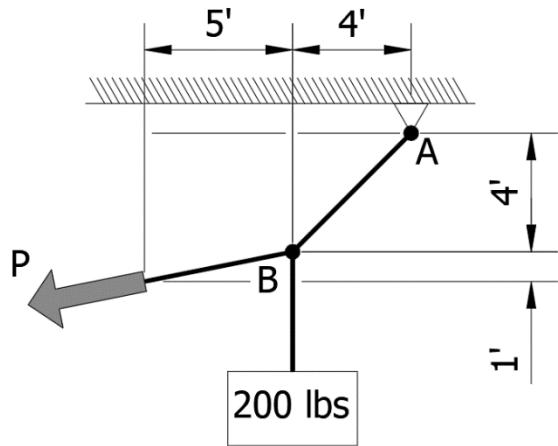


- A. 60 kN
- B. 70 kN
- C. 130 kN
- D. 140 kN



**C. Equilibrium of rigid bodies**

**Question 5:** Consider the cable system below that supports the hung load indicated. Ignore self-weight. The magnitude of the force  $P$  to maintain equilibrium with the geometry indicated is most nearly:

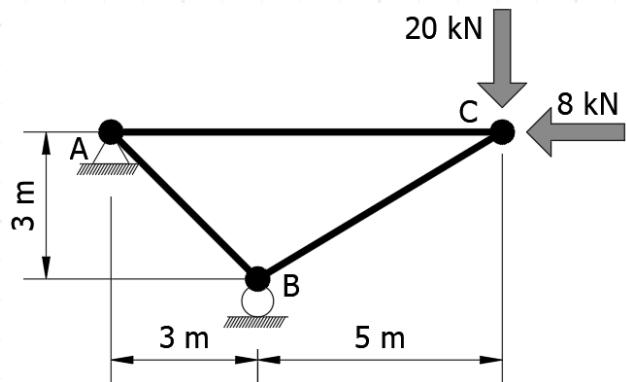


- A. 55 lbs
- B. 250 lbs
- C. 255 lbs
- D. 350 lbs



**D. Frames and Trusses**

**Question 6:** Consider the truss and loading shown below. Ignore self-weight. The magnitude of the force in member AC due to the applied loads is most nearly:

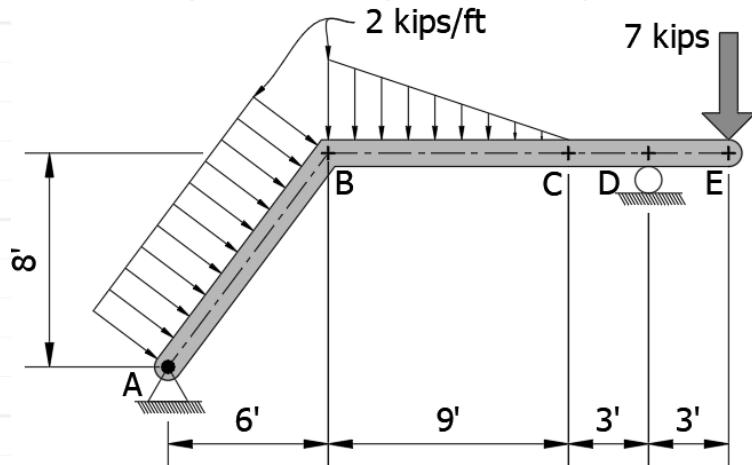


- A. 8 kN
- B. 22 kN
- C. 25 kN
- D. 39 kN



**D. Frames and Trusses**

**Question 7:** Consider the rigid frame and applied loads below. Ignore self-weight. The magnitude of the vertical reaction at D due to the applied loads is most nearly:

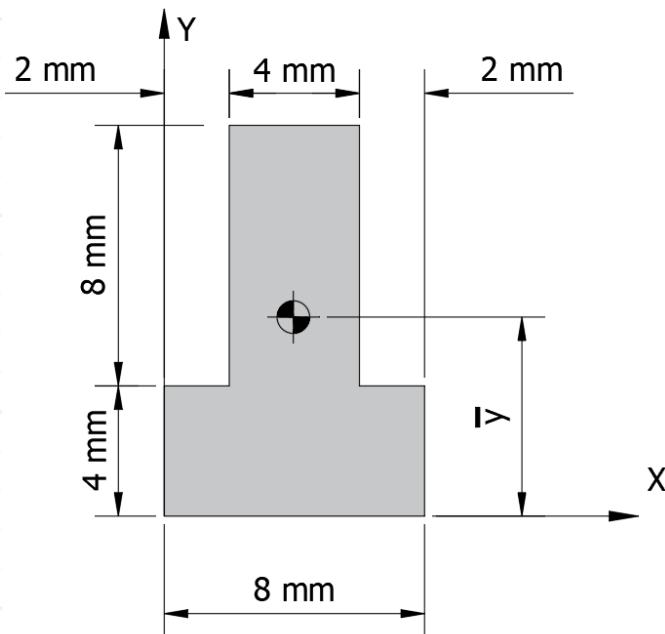


- A. 18 kips
- B. 22 kips
- C. 28 kips
- D. 36 kips



**E. Centroid of area**

**Question 8:** For the figure shown below, the location of the centroid,  $\bar{y}$ , with respect to the X-axis is most nearly:

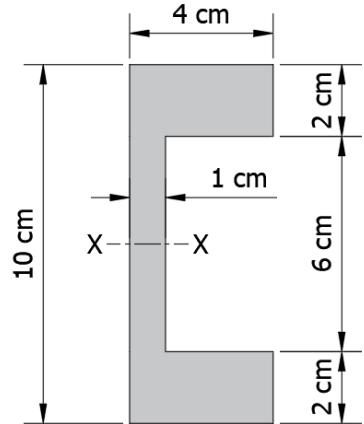


- A. 5.0 mm
- B. 5.2 mm
- C. 5.5 mm
- D. 6.0 mm



**F. Area moments of inertia**

**Question 9:** The moment of inertia about the X-X axis of the shape below is most nearly:

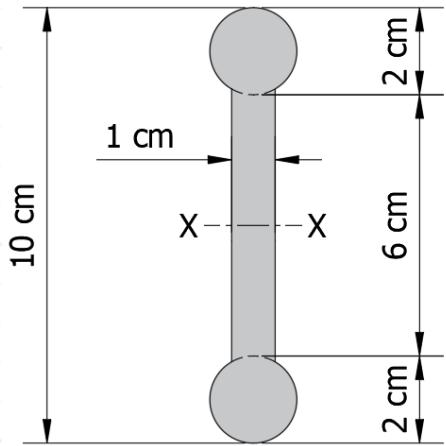


- A.  $270 \text{ cm}^4$
- B.  $280 \text{ cm}^4$
- C.  $290 \text{ cm}^4$
- D.  $300 \text{ cm}^4$



**F. Area moments of inertia**

**Question 10:** The moment of inertia about the X-X axis of the shape below is most nearly:

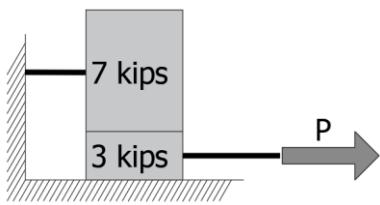


- A. 90  $\text{cm}^4$
- B. 100  $\text{cm}^4$
- C. 110  $\text{cm}^4$
- D. 120  $\text{cm}^4$



**G. Static friction**

**Question 11:** Two blocks rest on a horizontal surface with one block on top of the other. The surface between the blocks has been intentionally roughened so that the coefficient of friction between blocks is 0.55. The coefficient of friction between the bottom block and the horizontal surface is 0.40. The top block is restrained so that it cannot move horizontally. The force  $P$  that is required to move the bottom block is most nearly:

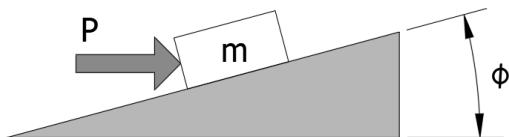


- A. 6.7 kips
- B. 7.5 kips
- C. 7.9 kips
- D. 9.4 kips



**G. Static friction**

**Question 12:** A block with mass of 200 kg rests on an inclined plane with angle  $\phi = 15^\circ$ . The coefficient of static friction between the body and the plane is 0.35. A force  $P$  acts horizontally through the center of mass of the body. The magnitude of force  $P$  that will cause motion to begin up the plane is most nearly:



- A. 1100 N
- B. 1200 N
- C. 1300 N
- D. 1400 N