

Midterm Exam - Practice**Time allowed: 50 minutes****Open book, open notes****No cell phones****All answers should be on these pages. Use the backs of pages if necessary, but clearly identify which question your work is associated with.****GRADING SHEET – MIDTERM****NAME:** _____

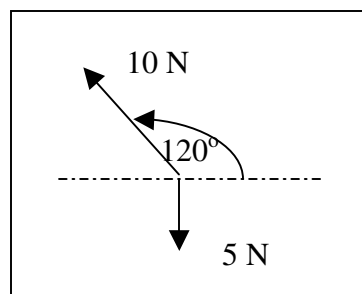
		Points awarded	Max points
Question 1. (20 points)	a) b) c) d)		4 4 6 6
Question 2. (20 points)	a) b) c) Magnitude Direction		5 5 5 5
Question 3. (25 points)	a) Free body diagram b) Equilibrium Equations c) Forces		5 10 10
Question 4. (20 points)	Response Rationale Relationship to code of ethics		5 5 10
Question 5. (15 points total)	Factor 1 Factor 2 Factor 3		5 5 5
TOTAL			100

QUESTION 1. (Short Answer Questions)

- a. What does ASCE stand for?
- b. What is ASCE?
- c. What qualifications does a Engineer-in-Training (EIT) have?
- d. Describe in one or two sentences a sub-discipline of civil engineering?

QUESTION 2.

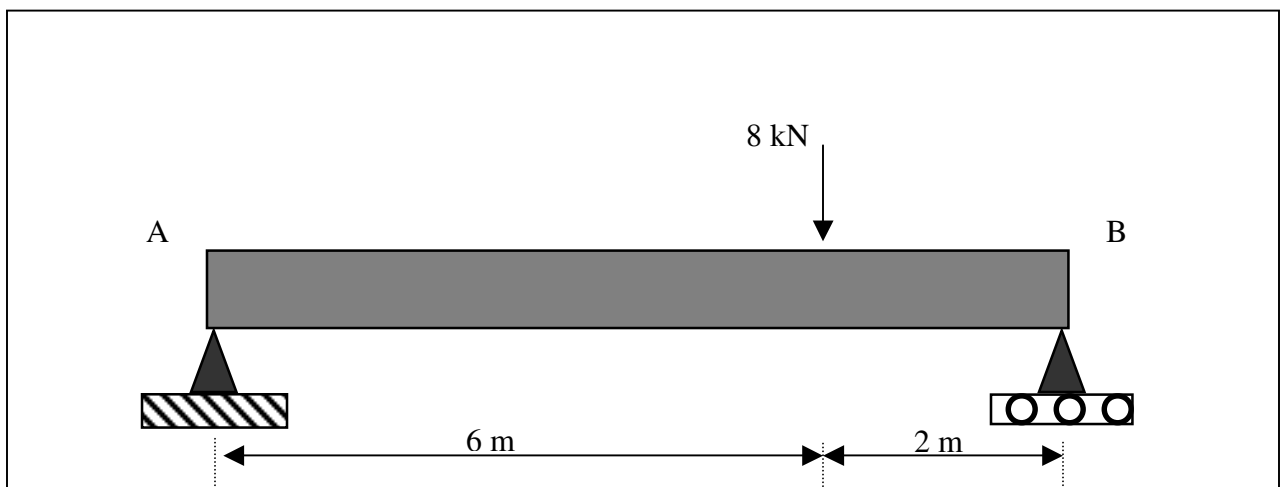
A 10 N force is applied at 120° to the horizontal. A 5 N weight hangs vertically from the same point. The following free body diagram represents the two forces.



- a. Compute the horizontal and vertical components of the 10 N force.

- b. Compute the total force in the horizontal and vertical directions for both the 10 N and 5 N forces.
- c. Determine the magnitude and direction of the resultant force.

QUESTION 3.



Assume the beam in the above diagram is weightless.

- a. Draw the free body diagram for the beam

- b. Write the equilibrium equations for
 - i. The forces in the vertical direction.

 - ii. The forces in the horizontal direction

 - iii. Moments about the joint A.

- c. Compute the reactions at A and B by solving the equations above

QUESTION 4.

In the case of the improperly designed overhang, one suggested solution is for Sarah and and Joe to write a letter to Timmo stating clearly and forthrightly their concerns with the design of the overhang. Would this get Pines (Joe, Sarah and Chris) off the hook? Why or why not? Your answer should reference the ethical responsibilities of engineers.

QUESTION 5.

Describe three factors a bridge designer should take into account when considering what type of bridge (truss, suspension, arch etc) to use for a particular location. Explain why each factor is important.

Factor 1: _____

Description (one sentence):

Why is this factor important (one sentence)?

Factor 2: _____

Description (one sentence):

Why is this factor important (one sentence)?

Factor 3: _____

Description (one sentence):

Why is this factor important (one sentence)?