Engineering Studies

Section III (continued)

Marks

Question 18 — Engineering and the Engineering Report (10 marks)

(a)   Discuss the use of CAD systems as an alternative to traditional drawing methods.   **3**

Engineers, due to addvancements in Computer Aided Design, can now create and test designs on their computer. For engineers this means that design can be done faster, as mistakes are just deleted, more ~~eg~~ environmentally friendly, as not as much paper is used, and cheaper as it takes less time to design or develop. It is however, harder to learn and create the desired object than traditional methods.

Question 18 (continued)

(b)

(i) In many public areas, polymer containers similar to those shown are provided for rubbish and recyclable materials. Describe a forming process to produce the main body of these large containers.

       2

The main body could be formed by blowing. This is where an amount of ~~liquidied~~ liquified plastic is poured into a mauld with air blown into the middle of the of the plastic, pushing it to the out walls of the mould. It is then left to cool.

(ii) The lids used for the containers are moulded from polyethylene. Outline the reasons for this being a suitable choice of material in service.

       2

This is suitable as polyethylene is corrosion resistant, especially to UV light when compared to other polymers. This means it will not ~~harden age~~ harden and become more brittle.

Question 18 (continued)

(c) A loading ramp between a ferry and a wharf is shown. The ramp has a weight of 2 kN and a coefficient of static friction with the wharf of 0.2. There is no friction at the roller support.

7 m

25°

Roller

Wharf F= µN F= 0.2 N

2 kN

Ferry
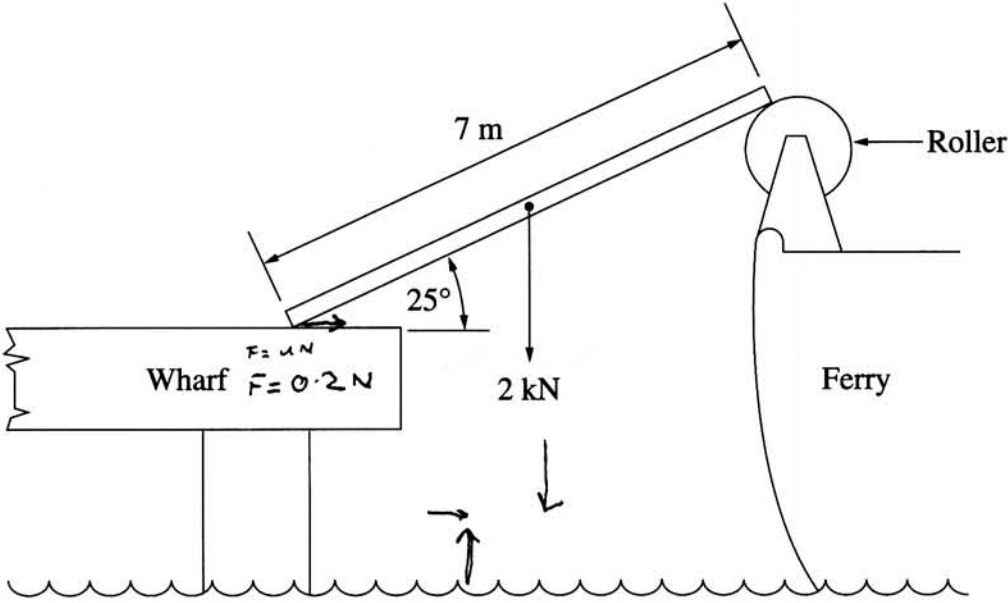
Sketch a free-body diagram of the ramp. Show whether the ramp will slip or remain static for these conditions.

weight

friction

Reaction
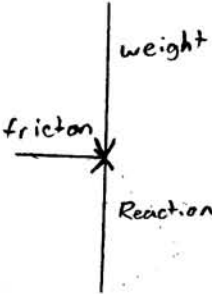
As there is no other horizontal forces except friction then the ramp will not move, but rather stay in its current equilibrium state.

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