

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

CAD methods are extensively used on computers by business and engineers to produce technical drawings. The traditional way of using pencil and rule has now been phased out by the convenience of CAD programs. The programs are easy to use and lines or whole drawings can be deleted in seconds.

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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 large body of these polymer bins may be rotation moulded. (eg- cans). The molten polymer is poured into a large mould and then slowly rotated to ensure the plastic is evenly spread.

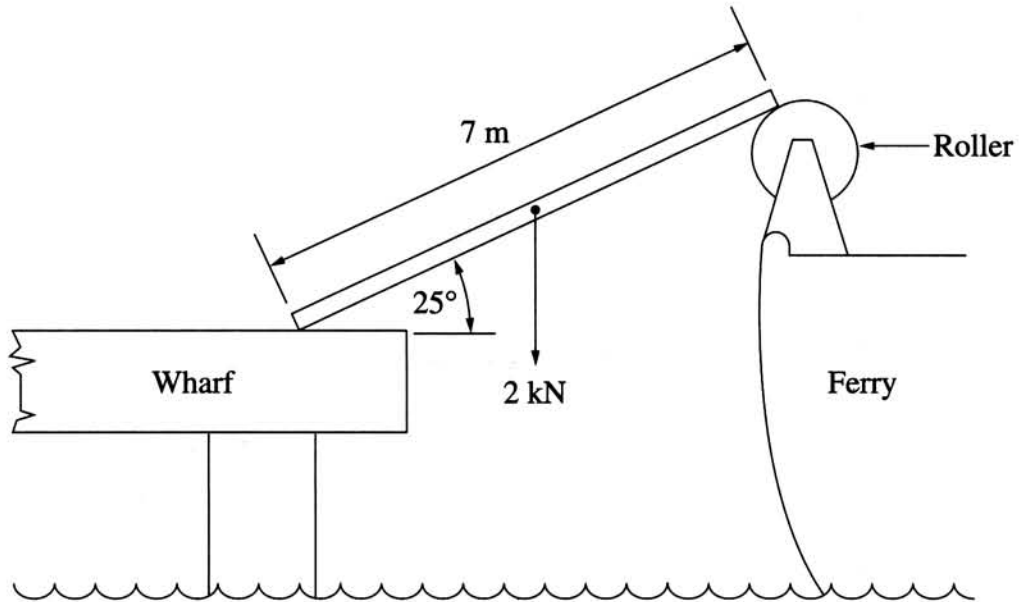
- (ii) The lids used for the containers are moulded from polyethylene. Outline the reasons for this being a suitable choice of material in service. 2

Polyethylene is very cheap and is very durable. as the lids are going to be opened and shut with a deal of force the material must withstand the force.

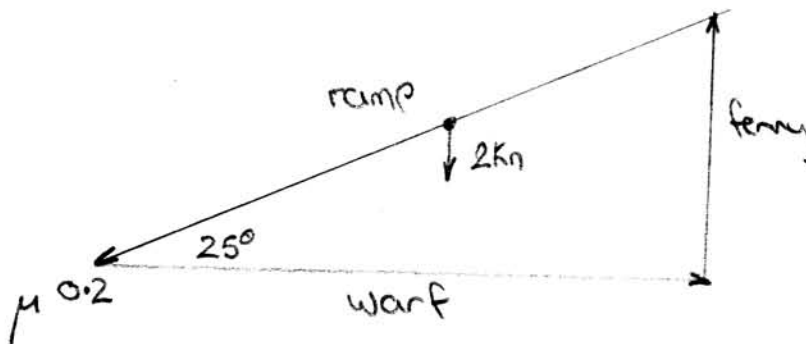
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Question 18 (continued)

- (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. 3



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



The ramp will slip.

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