

# 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

..... computer Aided design is used as  
..... ~~it is faster~~ ..... widely throughout engineering.  
..... It is faster ~~than~~ than traditional methods  
..... and mistakes are easily corrected. Multiple  
..... copies of designs can be produced and  
..... plans can be transmitted rather than  
..... all traditionally physical methods. Both  
..... cad and traditional methods require  
..... in depth training

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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

.....rotational moulding uses gravity.....  
 .....to form a polymer on the outside.....  
 .....of a mold the mold is rotated on.....  
 .....two different axis is to achieve this.....  
 .....

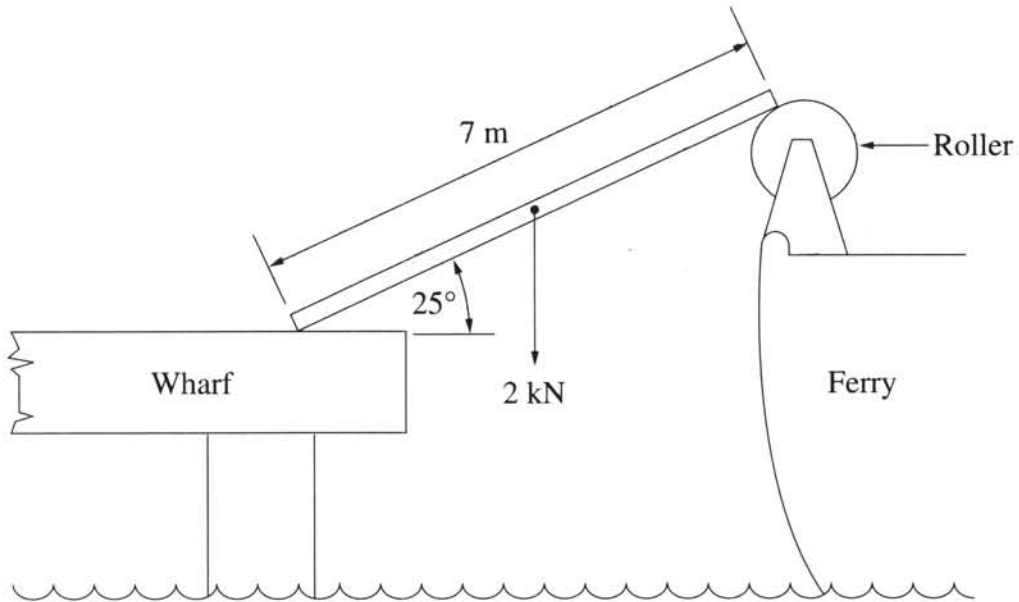
- (ii) The lids used for the containers are moulded from polyethylene. Outline the reasons for this being a suitable choice of material in service. 2

.....polyethylene can be produce with.....  
 .....different methods to produce required.....  
 .....properties. It is inexpensive and.....  
 .....easy to form.....  
 .....

Question 18 continues on page 33

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.

$\mu = 0.2$

$3.5 \text{ kN}$

$f_f = R_n \times \mu \quad .716$

$3.25$

$R_n$

$25^\circ$

$x$

$AB \cos 25 = 3.25$

$R_n = 3.58$

End of paper