

2003 HIGHER SCHOOL CERTIFICATE EXAMINATION  
Engineering Studies

Section III

20 marks

Attempt Questions 17–18

Allow about 40 minutes for this section

Answer the questions in the spaces provided.

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Marks

Question 17 — Engineering and the Engineering Report (10 marks)

Shade areas are to be added to a major harbourside transport interchange. The interchange is also a popular tourist destination.

- (a) An engineering report is to be produced for the development of shade areas near the interchange. Outline a technical issue and a social issue that would need to be considered in such a report. 2

Technical:

*The quality of the structure to withstand various conditions and material in which is best suited to withstand a long period of time.*

Social:

*The ~~use~~ changes that it would have on societal needs.*

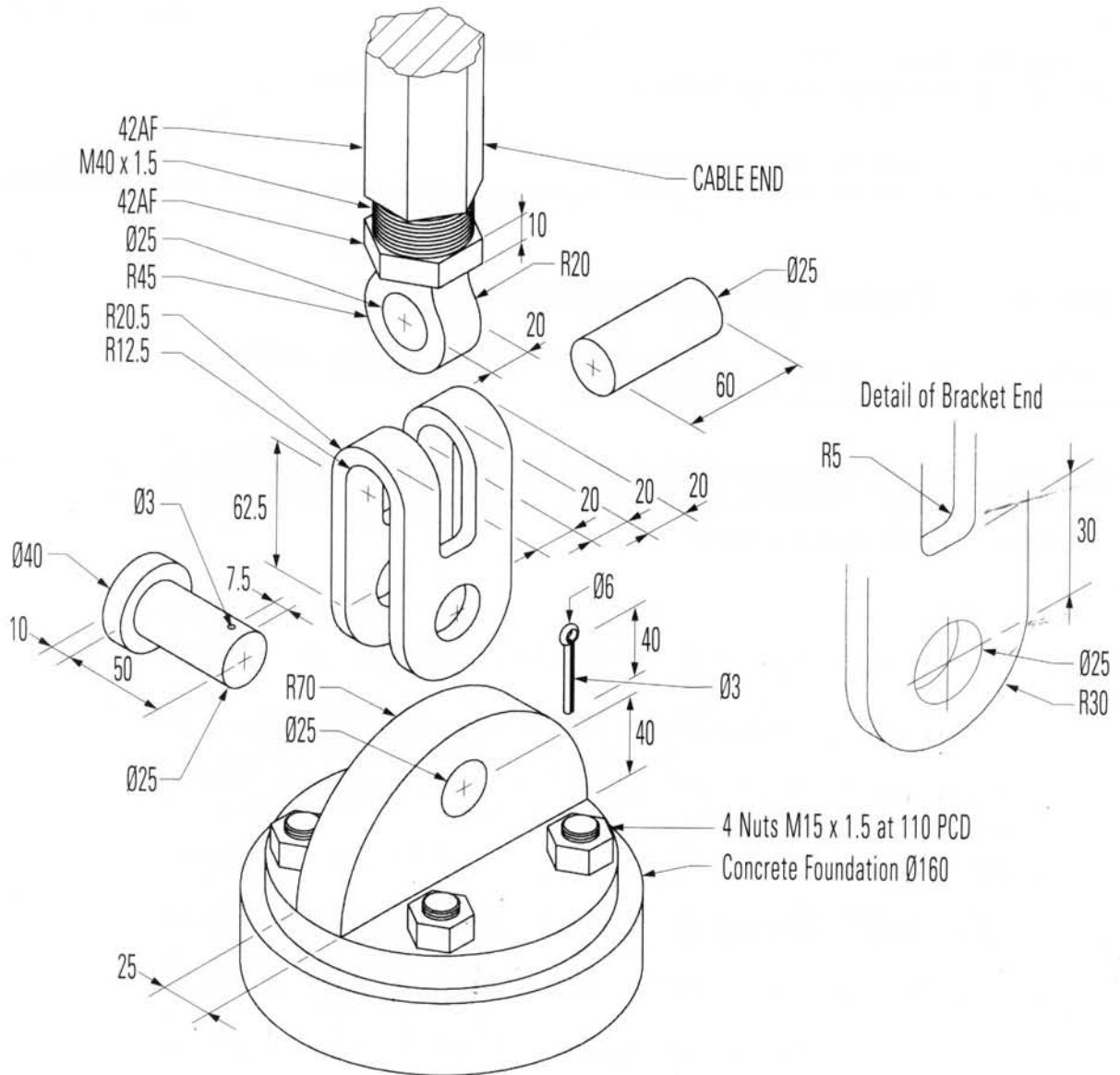
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Question 17 continues on page 28

Question 17 (continued)

(b) Details of a domestic shade area cable tensioning system are given.

4

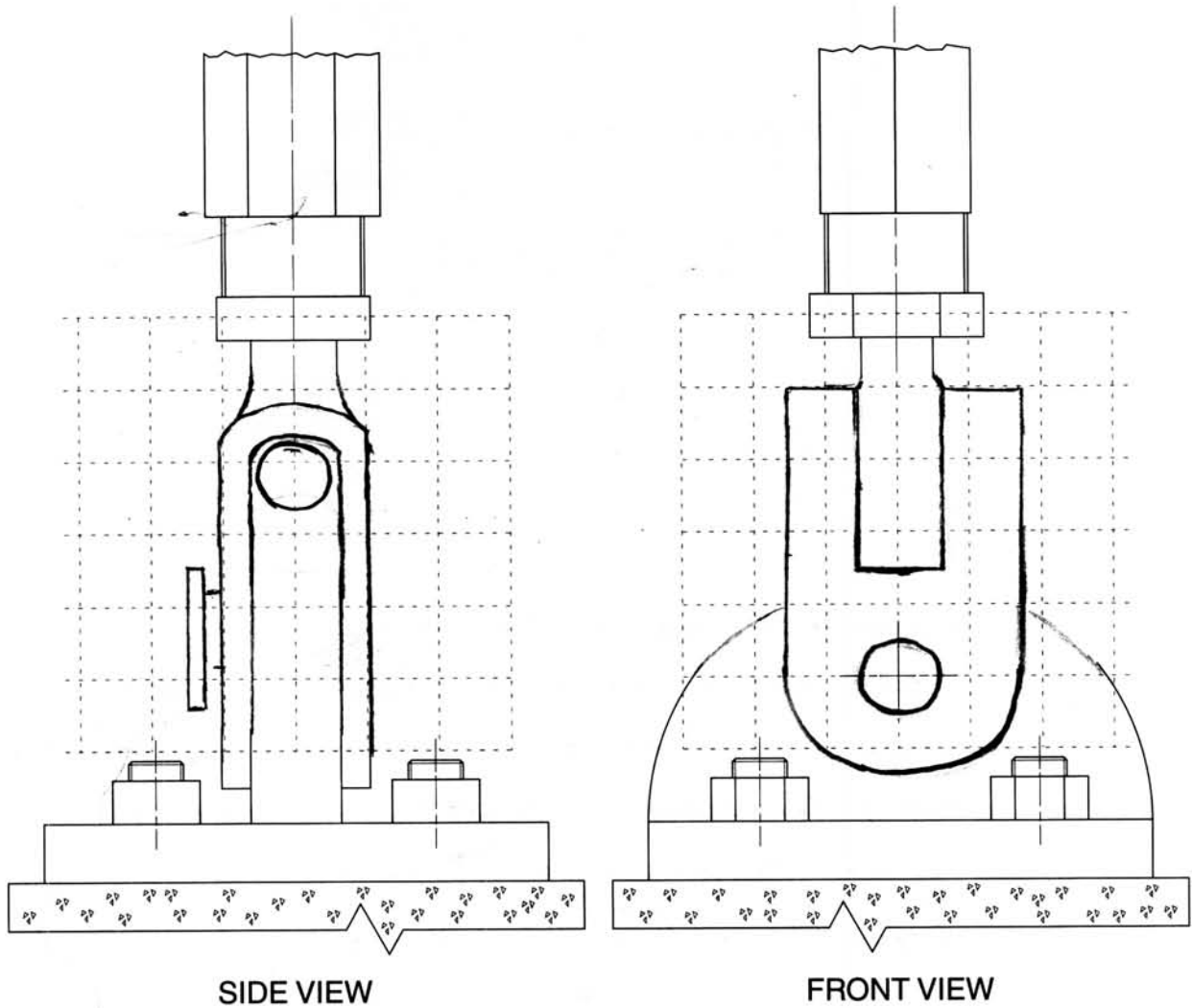


Question 17 continues on page 29

Question 17 (continued)

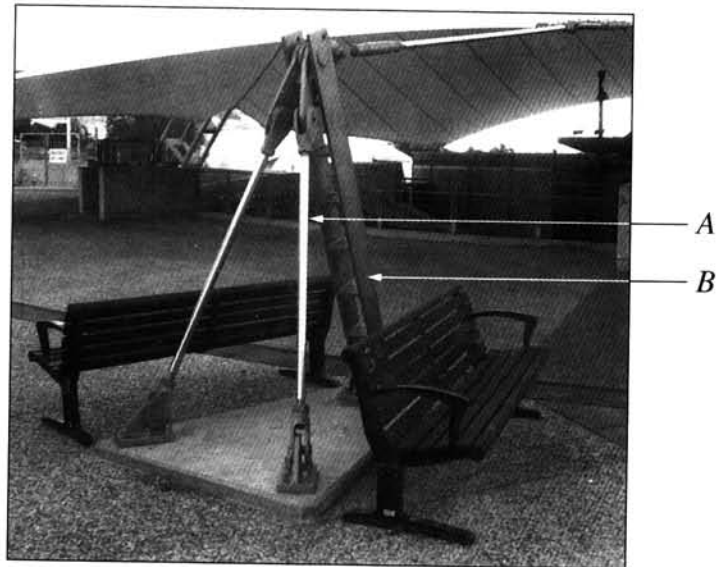
A partially completed orthogonal sketch of the front and side views of the assembly is shown, drawn to a scale of 1 : 2.

Complete the assembled orthogonal sketch on the grid. Apply AS1100 drawing standards where appropriate. DO NOT show hidden outline. DO NOT dimension.



Question 17 continues on page 30

(c)



- (i) A support for a public shaded area is shown in the photograph. Two types of members, A and B, are used to distribute the forces created by the weight of the fabric. 2

Explain the structural reasons for the difference in the shape and size of the members.

- Member A is in tension and are cylindrical in shape to withstand forces. They are anchored off to an anchorage point being the slab of concrete. Member B is under compressive state as it needs provide structure so that it does not twist. It's provide support and withstand greater forces.*
- (ii) PVC coated polyester fabric is widely used as the cover for shade areas. 2

Discuss how developments in engineering textiles have influenced the design of public shade structures.

*The fabric is to be developed to withstand natural condition. Cross hatched material it is chemically bonded together so that the material can provide protection against UV light.*

End of Question 17