

Engineering Studies

Section III

20 marks

Attempt Questions 17–18

Allow about 40 minutes for this section

Answer the questions in the spaces provided.

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:

..... strength of device to enable complete
..... safety for people seeking shade
..... from such a device

Social:

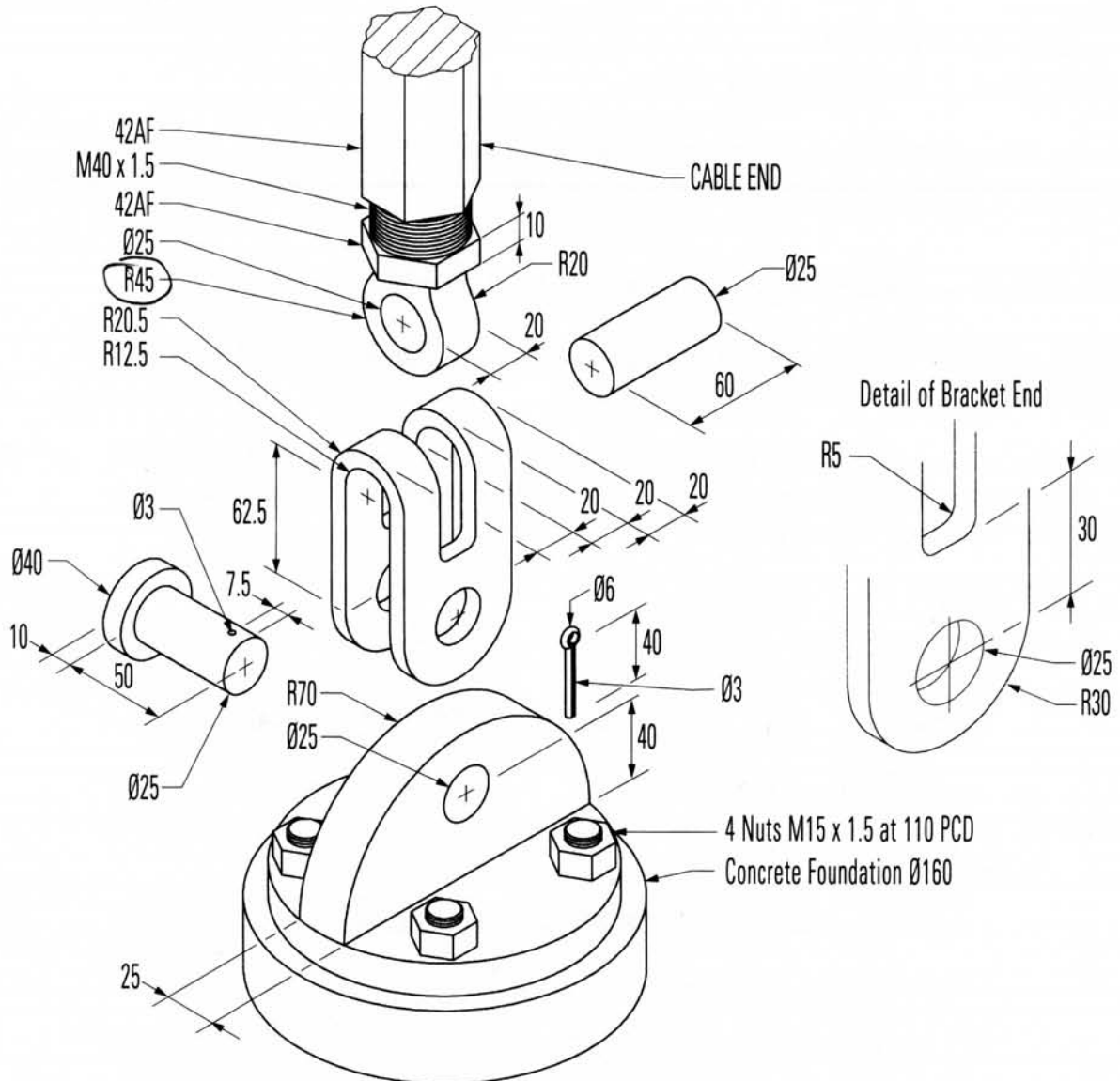
..... The shade device is sufficient in
..... providing complete Ultra Violet protection
..... but in term still allowing light to penetrate

Question 17 continues on page 28

Question 17 (continued)

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

4

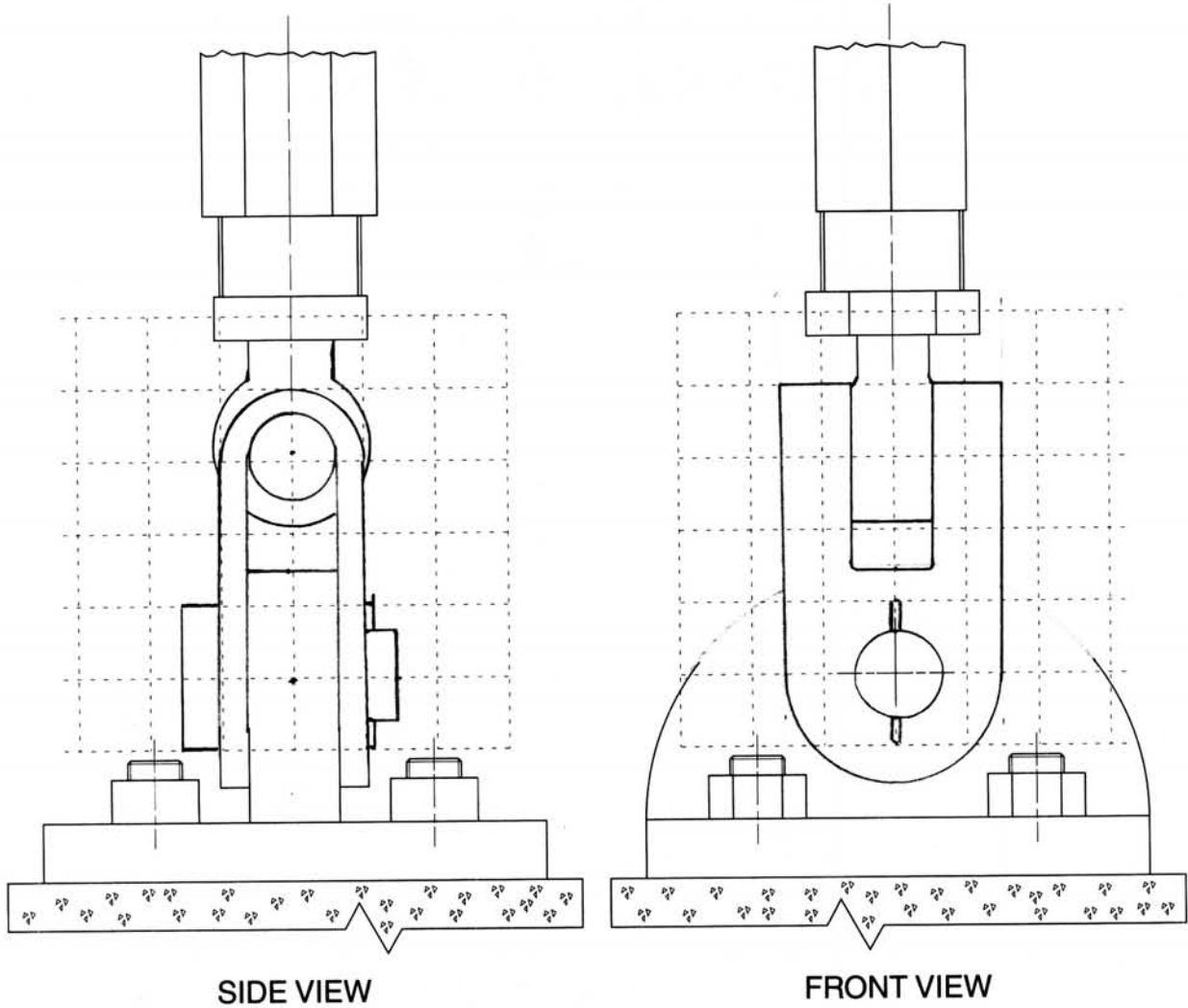


Question 17 continues on page 29

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.

Members (B) are in compression and also could be subject to torsion or transverse effect with wind here for they need a rectangular or square shape. Members A are in tension hence needing a circular tube shape for max strength.

- (ii) PVC coated polyester fabric is widely used as the cover for shade areas. Discuss how developments in engineering textiles have influenced the design of public shade structures. 2

With further developments in material fabrics, engineering textiles has allowed stronger materials to span over greater areas with less supports and also U.V protection is enhanced.

End of Question 17