

2003 HIGHER SCHOOL CERTIFICATE EXAMINATION
Engineering Studies

Section II

70 marks

Attempt Questions 11–16

Allow about 2 hours for this section

Answer the questions in the spaces provided.

Marks

Question 11 — Historical and Societal Influences, and the Scope of the Profession (10 marks)

(a) The range of knowledge in which an aeronautical engineer is trained includes: 4

- aerodynamics
- fluid mechanics
- engineering materials
- legal and ethical implications.

Demonstrate how each of these four knowledge areas may be appropriately applied to the design or construction of an aircraft or its components.

- Aerodynamics are use in the design of the shape of a aircraft, to overcome the problem of air resistance.
- Fluid mechanics is use when designing or making hydrolics use in aircraft.
- Engineering materials knowlede is use for deciding which ~~wa~~ material to use for a specific job, counting on the materials properties.
- The ~~knowlede~~^{knowlede} of legal and ethical issues is usefull for an engineer to know what is acceptable by the law and by scociety in case some thing might go wrong.

Question 11 continues on page 10

Question 11 (continued)

(b) Improvements to materials over the past 200 years have changed the significant design features of civil structures. These features include:

- the height of the structures
- the length of unsupported spans
- the load carried by structures
- the stiffness of structures
- the expected lifespan of structures.

(i) Outline how the improvements to materials have affected any TWO of these features. 3

concreat has improve by ~~been~~ been reinforced and ^{stressed} ~~reinforced~~. This allows to build longer unsupported spans than the original concreat without reinforcement or ^{stressed} ~~reinforced~~. Wood been changed to metal or concreat in materiul to make a brigde. This alowes for longer expected life span and stiffness of brigdes.

(ii) Discuss how society has been affected by the changes to any TWO of these features. 3

We can ~~now~~ now build very large, tall skyscrapers, which allows us be have a very dence population in one small ~~area~~ ~~area~~ area such as a CBD. We now can built bridges that will last much longer because they are ~~made of~~ ~~made of~~ do not get swept away is bad weather unlike wooden bridges.

End of Question 11