

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 is the process of checking the air-flow over a surface of an aircraft, suitability of landing at a low altitude below the ground.
- Fluid mechanics is the static pressure of the aircraft determines the hydraulic pressure of the base, to lift the weight.
- Engineering materials are the components of the aircraft in aviation, and their uses, also how they work.
- legal and ethical implications, are the safety procedures, etc OHS, government regulation in the environment and society.

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

- 1) The expected lifespan of structures have dramatically large, of building roads, where there is a lot of expansion occurring, causing more people on the road, by lifespan giving more way to traffic.
- 2) Load carried by structures are causing, with cracks etc on roads, but changes have caused to rebuild, and make the structure more secure for people to pass through.

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

- 1) Society with cracks on the road, occurring by large vehicles damaging roads, people don't care, and just drive over the dips, to cause a greater hazard of bigger holes.
- 2) Lifespan on roads are been a big affect on society, with contractors blocking the entrance, to build better roads to drive.

End of Question 11