

**Engineering Tripos Part IB 2014**  
**Paper 8 Selected Topics**

SECTION C – Mechanics, Materials and Design

**Answers**

6. (c) 16.3 years
7. (c) (i) 1.87, 4.42 MW, 2.4, 3.2 rad/s  
(c) (ii) 8493, 10951 MWhr  
(c) (iii) 0.518, 0.282
8. (a) (ii)  $4a(1 - a)$   
(b)  $V_{\text{car}} = V_{\text{wind}}(1 - a)/a$   
(c) (i) 4, (ii) 3

**ENGINEERING TRIPOS PART IB 2014**

**PAPER 8 SECTION D - AEROTHERMAL ELECTIVE  
ANSWERS**

9. (b) 827.94 K, 0.399 (c) 1.693, 383.3 kPa (d) 414 m/s
10. (b) 18.82 (c) 19.7, 0.687 (d) 9.8% increase
11. (b) 0.828, 0.440, 0.364 (c) 255.2 K, 41.7 kPa, 378.8 kg/s, 1.774, 0.508  
(d) 0.437, 0.423, 0.188

**Paper 8, Section G, 2014: Numerical Answers**

18. (c) (ii) 4.98 s  
(iii) 1.63 s  
(iii)  $\approx 0.1$  MPa
19. (b) (i) 1889  
(ii) 19.6 GHz; 24.8 GHz