P 1051 Winter 2007

1 (a) C
1 (b) C
1 (c) B
1 (d) B
1 (e) C
1 (f) A
1 (g) C
1 (h) D
1 (i) D
1 (j) D

2 (a) (i) 2.01 s
2 (a) (ii) 1.40 m/s
2 (a) (iii) $\pi/2$
2 (b) 1.64 s

3 (a) Beats are a result of the constructive interference of the two sound waves with different frequencies.
3 (b) 436 Hz
3 (c) 40.74 g

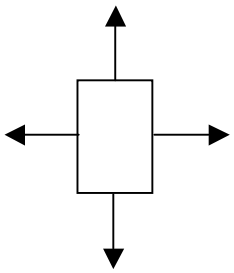
4 (a) $E_x = 2/\sqrt{2}$ V/m, $E_y = -4/\sqrt{3}$ V/m, $E_z = -4/\sqrt{3}$ V/m
4 (b) 3.56 V/m
4 (c) 0.0726 Nm^2/C

5 (a) 1.87×10^{-5} T left
5 (b) 6.00×10^{-5} N down

6 (a) 0.0300 V
6 (b) 0.120 Ω
6 (c) counter clockwise

7 (a) (3Q) / (2a)
7 (b) (3kQ) / (a^2)
7 (c) smaller: (3kQ) / ($4a^2$)

8 (a)



8 (b) 5.00×10^{-6} N left
8 (c) zero

9 (a) Light waves interfere constructively to form bright spots and destructively to form dark areas.
9 (b) 6.49×10^{-7} m
9 (c) move further apart