

**SECTION B: GENERAL AND INORGANIC CHEMISTRY, (2/3) 2011**  
(33 marks)

Answer questions B1 – B8 in the spaces provided on the following pages.

B1. The minimum energy required to cause the photoelectric effect in potassium metal is  $3.69 \times 10^{-19}$  J.

- (a) Light with a wavelength of 400 nm is shone on potassium. Calculate the energy associated with this radiation.

(3 marks)

- (b) Determine whether the photoelectric effect will be produced when light with a wavelength of 400 nm is shone on potassium. Briefly explain your answer.

(1 mark)

B2. All particles can act as waves. Use the data from the table below to explain why wave behaviour is only significant if the particles are small. Calculations are not required.

| Particle    | Mass / kg              | Speed / $\text{m s}^{-1}$ |
|-------------|------------------------|---------------------------|
| tennis ball | 0.0567                 | 56                        |
| electron    | $9.11 \times 10^{-31}$ | $5.0 \times 10^6$         |

(2 marks)