

**Marks**  
**3**

- Calculate the energy (in J) and wavelength (in nm) expected for an emission associated with an electronic transition from  $n = 4$  to 3 in the  $B^{4+}$  ion.

Energy =

Wavelength =

**2**

- Describe how EITHER the *photoelectric effect* OR the *visible spectrum of hydrogen* contributed to the development of quantum mechanics.