5 **(a)** **(i)** Find how many different 4-digit numbers can be formed using the digits 1, 3, 4, 6, 7 and 9. Each digit may be used once only in any 4-digit number. [1]

(ii) How many of these 4-digit numbers are even and greater than 6000? [3]

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(b) A committee of 5 people is to be formed from 6 doctors, 4 dentists and 3 nurses. Find the number of different committees that could be formed if

(i) there are no restrictions, [1]

(ii) the committee contains at least one doctor, [2]

(iii) the committee contains all the nurses. [1]

6 A particle P is initially at the point with position vector $\begin{pmatrix}30\\10\end{pmatrix}$ and moves with a constant speed of $10\,\text{ms}^{-1}$ in the same direction as $\begin{pmatrix}-4\\3\end{pmatrix}$.

(a) Find the position vector of P after t s. [3]

As P starts moving, a particle Q starts to move such that its position vector after t s is given by $\begin{pmatrix}-80\\90\end{pmatrix}+t\begin{pmatrix}5\\12\end{pmatrix}$.

(b) Write down the speed of Q. [1]

(c) Find the exact distance between P and Q when $t = 10$, giving your answer in its simplest surd form. [3]

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