6 **(a)** State an expression for the electric field strength E at a distance r from a point charge Q in a vacuum.
State the name of any other symbol used.

.....

.....

..... [2]

(b) Two point charges A and B are situated a distance 10.0 cm apart in a vacuum, as illustrated in Fig. 6.1.

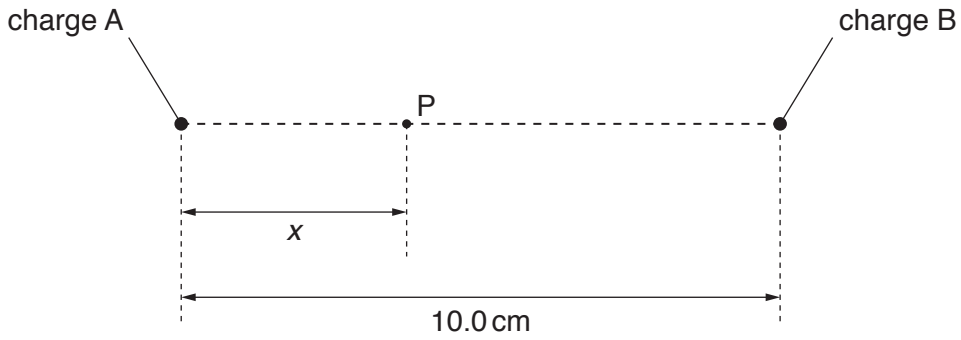

Fig. 6.1

A point P lies on the line joining the charges A and B. Point P is a distance x from A.

The variation with distance x of the electric field strength E at point P is shown in Fig. 6.2.

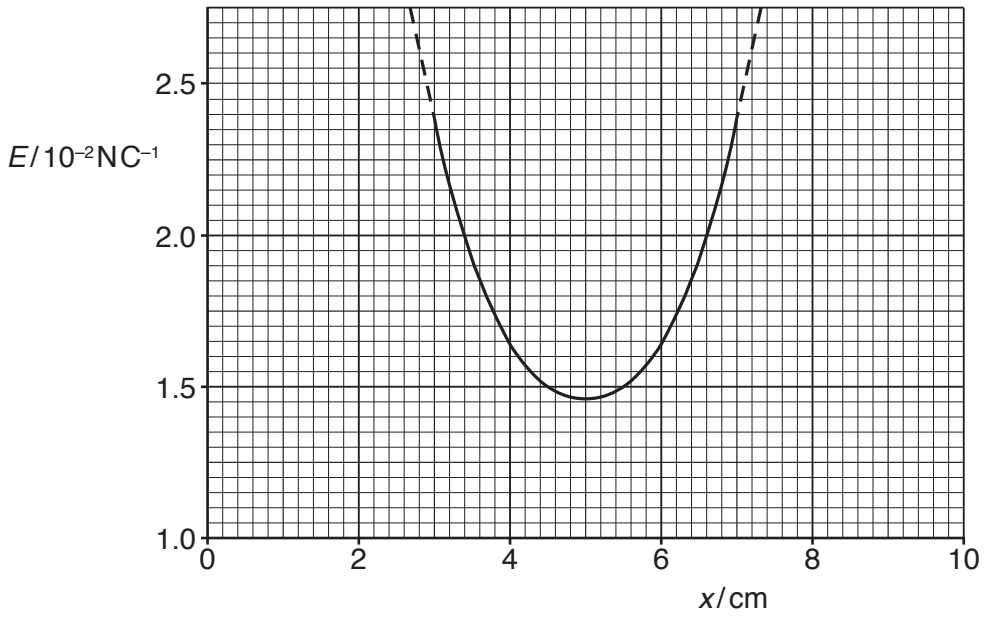

Fig. 6.2

State and explain whether the charges A and B:

(i) have the same, or opposite, signs

.....

.....

..... [2]

(ii) have the same, or different, magnitudes.

.....

.....

..... [2]

(c) An electron is situated at point P.

Without calculation, state and explain the variation in the magnitude of the acceleration of the electron as it moves from the position where $x = 3\,\text{cm}$ to the position where $x = 7\,\text{cm}$.

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.....

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.....

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..... [4]

[Total: 10]