5 **(a)** Define electric potential at a point.

.....

.....

..... [2]

(b) A hydrogen atom may be considered to consist of a proton and an electron separated by a distance of 120 pm, as shown in Fig. 5.1.

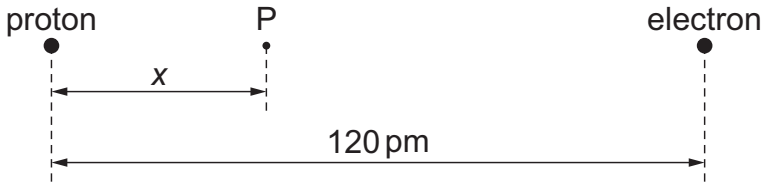

Fig. 5.1

The two particles may be considered as point charges.

Point P lies on the line joining the electron and the proton and is at a variable distance *x* from the proton.

(i) Show that the electric potential *V* at point P when *x* = 10 pm is equal to 130 V.

[2]

(ii) Calculate, to two significant figures, *V* when *x* = 30 pm.

V = ...V [2]