5 **(a)** Define *electric field strength*.

....

.... [1]

(b) An isolated metal sphere is to be used to store charge at high potential. The charge stored may be assumed to be a point charge at the centre of the sphere. The sphere has a radius of 25 cm. Electrical breakdown (a spark) occurs in the air surrounding the sphere when the electric field strength at the surface of the sphere exceeds 1.8×10^4 V cm^{-1}.

(i) Show that the maximum charge that can be stored on the sphere is $12.5\,\mu$C.

[2]

(ii) Calculate the potential of the sphere for this maximum charge.

potential = ... V [2]