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

.....

.....

..... [2]

(b) An isolated solid metal sphere of radius r is given a positive charge.

The potential at the surface of the sphere is 9.0×10^4 V. At a distance of $3r$ from the centre of the sphere, the electric field strength is 2.0×10^5 N C^{-1}.

(i) Determine the electric field strength at the surface of the sphere.

electric field strength = ... N C^{-1} [2]

(ii) Show that the radius of the sphere is 5.0 cm.

[2]

(iii) Calculate the charge on the sphere.

charge = ... C [2]

(iv) Use your answer in **(b)(iii)** to determine the capacitance of the sphere.

capacitance = ... F [2]

[Total: 10]