7 (a) (i) Define *capacitance*.

.....

.....[1]

(ii) Use the expression for the electric potential due to a point charge to show that an isolated metal sphere of diameter 25 cm has a capacitance of 1.4×10^{-11} F.

[2]

(b) Three capacitors of capacitances 2.0 μF, 3.0 μF and 4.0 μF are connected as shown in Fig. 7.1 to a battery of e.m.f. 9.0 V.

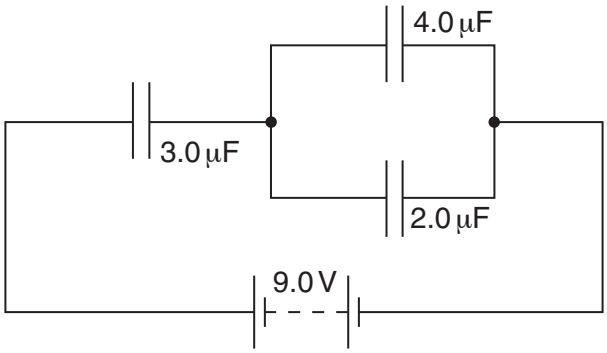

Fig. 7.1

Determine

(i) the combined capacitance of the three capacitors,

capacitance = ... μF [1]

(ii) the potential difference across the capacitor of capacitance 3.0 μF,

potential difference = ... V [2]

(iii) the positive charge stored on the capacitor of capacitance 2.0 μF.

charge = ... μC [2]

[Total: 8]