



A Level Physics A

H556/02 Exploring physics

Question Set 8

- 1(a) A capacitor of capacitance 7.2 pF consists of two parallel metal plates separated by an insulator of thickness 1.2 mm . The area of overlap between the plates is $4.0 \times 10^{-4}\text{ m}^2$. Calculate the permittivity of the insulator between the capacitor plates.

permittivity = F m^{-1} [2]

- (b) Fig. 21 shows a circuit.

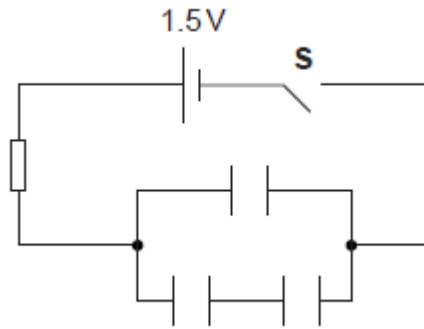


Fig. 21

The capacitance of each capacitor is $1000\text{ }\mu\text{F}$. The resistance of the resistor is $10\text{ k}\Omega$. The cell has e.m.f. 1.5 V and negligible internal resistance.

- (i) Calculate the total capacitance C in the circuit.

$C = \dots\dots\dots\text{ }\mu\text{F}$ [2]

- (ii) The switch **S** is closed at time $t = 0$. There is zero potential difference across the capacitors at $t = 0$.

Calculate the potential difference V across the resistor at time $t = 12\text{ s}$.

$V = \dots\dots\dots\text{ V}$ [2]

Total Marks for Question Set 8: 6

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