

It is not departmental policy to provide complete specimen answers to past examination papers. However, to help you in revision, numerical values and similar information are given below so that you can check your attempts. If you have attempted past questions and wish to discuss the descriptive questions or the details of your calculations, please see me!

Dr Booth

Question 1

- a) Force in negative y direction, of magnitude $\frac{3Qq}{250\pi\epsilon_0 a^2}$.
- c) Capacitance is 8.85×10^{-10} F.
- d) Voltage across terminals is 4.8 V.
- e) Terminal voltage is 11.5 V.
- g) Temperature coefficient of resistivity is $4.4 \times 10^{-3} \text{ } ^\circ\text{C}^{-1}$.
- h) Speed is $6.4 \times 10^5 \text{ m s}^{-1}$.
- i) Resistance is 530 Ω .

Question 2

- d) τ is 2.5×10^{-14} s.

Question 3

b)iii) $E = \frac{\lambda}{4\pi\epsilon_0} \frac{a}{b(b-a)}$.

iv) As $b \rightarrow \infty$ $E \rightarrow \frac{\lambda a}{4\pi\epsilon_0 b^2} = \frac{Q}{4\pi\epsilon_0 b^2}$ as expected.