

Practice Question Set For A-Level  
**Subject : Physics**  
**Paper-1 Topic :7\_ Electric Field**

Student: \_\_\_\_\_

Max. Marks : 16 Marks

Time : 16 Minutes

**Q1.**

At the beginning of the 20th century, Rutherford carried out large-angle alpha particle scattering experiments using gold ( $^{197}_{79}\text{Au}$ ) foil.

The vast majority of the alpha particles went straight through the foil whilst a few were deflected straight back.

In one experiment the alpha particles had an initial energy of 7.7 MeV.

Calculate the distance of closest approach of the alpha particles to the nucleus of a gold atom. Assume that the gold nucleus remains at rest.

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Distance of closest approach = .....

**(Total for question = 4 marks)**

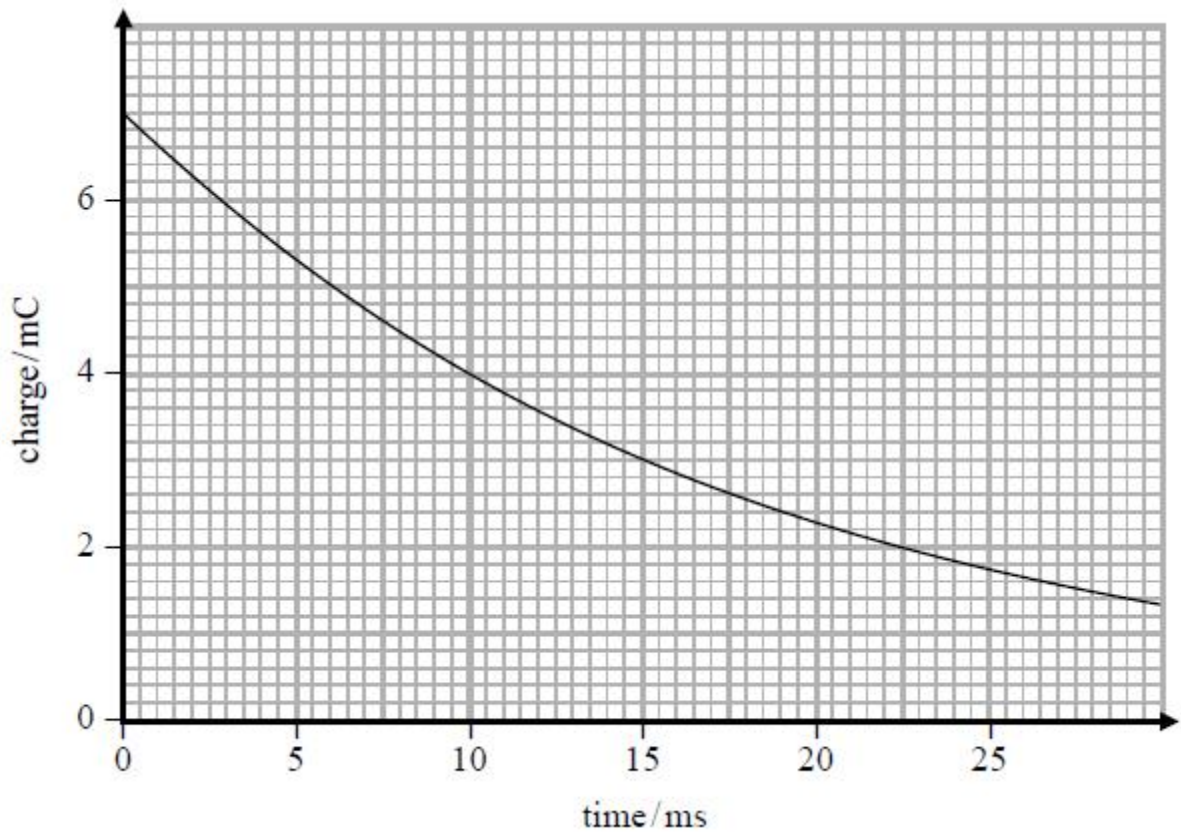
**Q2.**

What is the acceleration of an electron at a point in an electric field where the electric field strength is  $2.0 \times 10^4 \text{ N C}^{-1}$ ?

- A**  $2.8 \times 10^{-16} \text{ m s}^{-2}$
- B**  $3.2 \times 10^{-15} \text{ m s}^{-2}$
- C**  $1.8 \times 10^{11} \text{ m s}^{-2}$
- D**  $3.5 \times 10^{15} \text{ m s}^{-2}$

**(Total for question = 1 mark)**





Calculate the capacitance of the capacitor.

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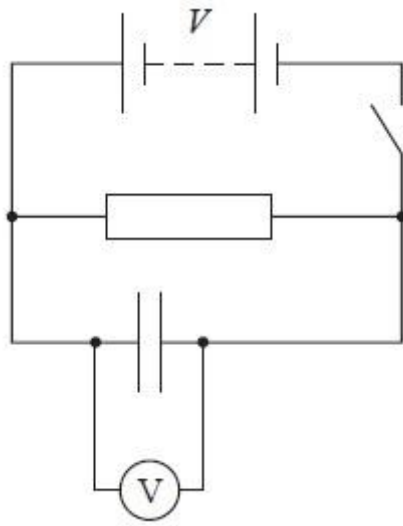
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Capacitance = .....

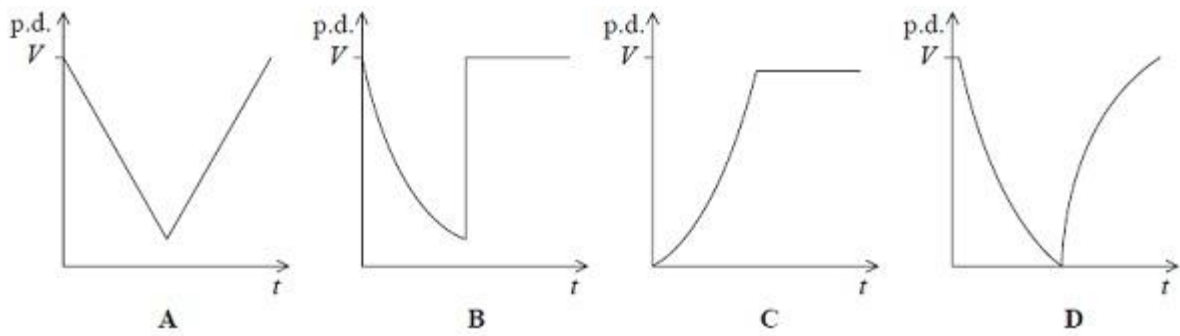
**(Total for question = 4 marks)**

**Q5.**

The capacitor shown in the circuit below is initially charged to a potential difference (p.d.)  $V$  by closing the switch. The power supply has negligible internal resistance.



The switch is opened and the p.d. across the capacitor allowed to fall. A short time later the switch is closed again. Select the graph that shows how the p.d. across the capacitor varies with time, after the switch is opened.



- A
- B
- C
- D

(Total for Question = 1 mark)