



**PHYSICS HOLIDAY WORK
S.6 PAPER P510/2**

- 1.(a) (i) Define **electric potential**. (1m)
(ii) Define an expression for electric potential at a point which is a distance r from a point charge Q . (4m)
- (b) Two charges of magnitude $6\mu F$ and $-10\mu F$ are placed at the corners A and D respectively of a rectangle ABCD shown in figure below.



Figure 1

AB=6cm and BD=4cm. Point E is the mid-point of AB. Find the work done in taking a point charge of $1.6 \times 10^{-10}C$ from D to E.

(5m)

- (c) A negatively charged ebonite rod is brought up to an uncharged pith-ball suspended by a silk thread. The pith-ball first moves to the rod touches it and then moves away. Explain these observations. (4m)
- (d)(i) A positively charged metal sphere P is placed adjacent to a neutral conductor R as shown



Figure 2

Sketch a graph to show how the electric field intensity varies with the horizontal distance from the left of P to a point on the right of R. (3m)

- (ii) Sketch another graph to show how electric potential varies with distance from the left of P to a point on the right of R. (3m)

2.(a)(i) Define **electrical resistivity** and **state its units**.

(2m)

- (ii) What is meant by **e.m.f** and **internal resistance** of a battery?

(2m)

- (b) Explain why the resistance of a metal increases when the temperature of the metal is increased. (2m)

- (c) Describe with the aid of a labelled diagram, how a slide wire potentiometer may be used to determine the e.m.f of a battery. (6m)

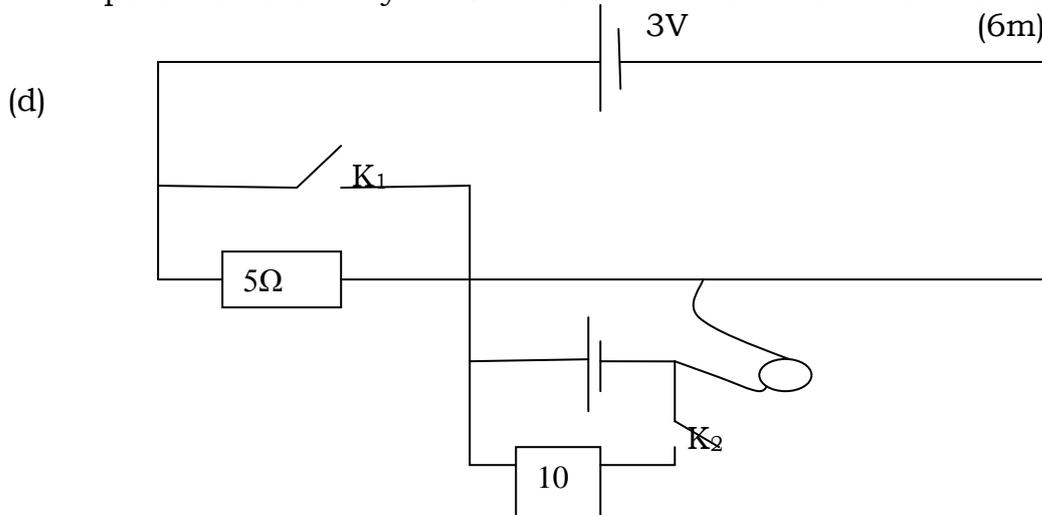


Figure 3

The circuit in figure 3 shows a uniform slide wire AB of length 100cm and resistance of 15Ω . The wire is connected in series with a resistor of resistance 5Ω across a 3.0V battery of negligible internal resistance.

A cell of e.m.f e and internal resistance r , is connected as shown. With switches K_1 and K_2 open, the galvanometer G shows no deflection when AD is 75.0cm. With K_1 open

and K_2 closed, the galvanometer shows no deflection when AD is 65.0cm. Find the

- (i) value of e.m.f, e .
- (ii) internal resistance, r
- (iii) balance length when K_1 is closed and K_2 is open.