OCR
Oxford Cambridge and RSA

# A level Physics B

**H557/01** Fundamentals of physics

## Question Set 15

**1. (a)** **Fig.1** shows the electric field pattern near two protons and **Fig.2** the electric field pattern near a proton and an electron.

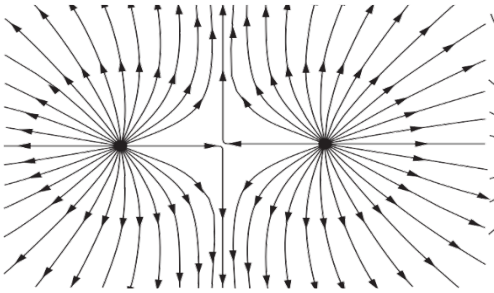

**Fig. 1**

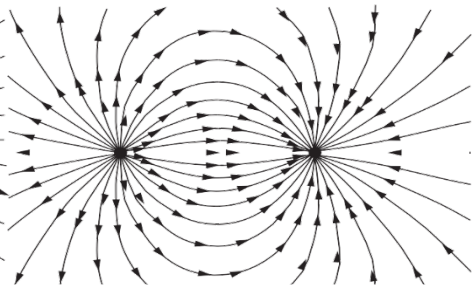

**Fig. 2**

On the appropriate figure(s) mark a point • **N** where the electric field is zero and a point • **V** where the electric potential is zero.

**[2]**

**(b)** On each of **Fig.1** and **Fig.2** draw **three** complete equipotential lines.

**[2]**

**(c)** **Fig. 2** can also represent two spherical charge distributions of +1 C and –1 C situated 1 km apart.

Calculate the electric field midway between the charge centres, at 500 m from each.

electric field =……V $m^{-1}$ **[2]**

**(d)*** **Fig. 3** shows the electrical potential $V$ and the magnitude of the electric field $E$ against distance $R$ for an isolated –1 C charge.

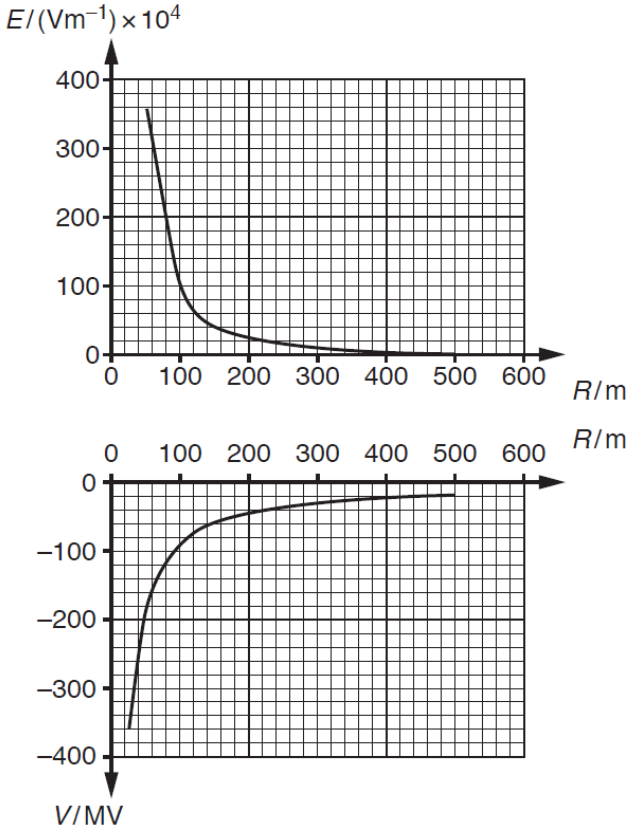


**Fig. 3**

By considering a unit positive charge being moved from $R$ = 100 m to 300 m explain the relationship between the electric field and the electric potential.

You may annotate the graphs in **Fig.3** if it is helpful.

**[6]**

## Total Marks for Question Set: 12