OCR
Oxford Cambridge and RSA

A level Physics B

H557/01 Fundamentals of physics

Question Set 26

1 (a) This question is about the electric field around protons.

Two protons are separated by 1.0×10^{-9} m as shown in **Fig. 1.1**. Point **X** is equidistant fromeach proton as shown.

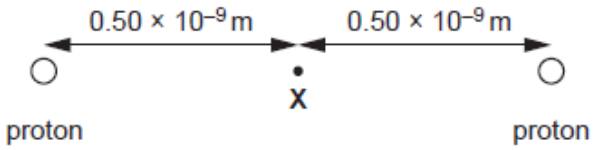

Fig.1.1 not to scale

(i) Explain why the electric field strength at **X** is zero.

[1]

(ii) Calculate the electric potential at **X**.

potential =.....V

[2]

(b) Imagine a third proton is positioned as shown in **Fig. 1.2**.

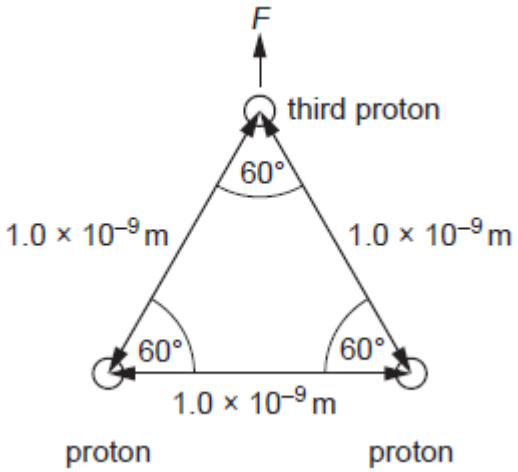

Fig. 1.2 not to scale

(i) Show that the resultant force *F* on the third proton is about 4×10^{-10} N in the direction shown. Explain your reasoning. You may include a diagram in your answer.

[4]

(ii) The separation of protons in a lithium $^{6}_{3}$Li nucleus is of the order of 10^{-15} m. Estimate the magnitude of the resultant electric force on a proton in the nucleus if the protons arearranged symmetrically as in **Fig. 1.2**.

force = ... N **[2]**

Total Marks for Question Set: 9