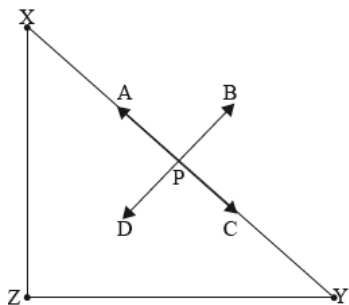


5.1 Practice Questions [14 marks]

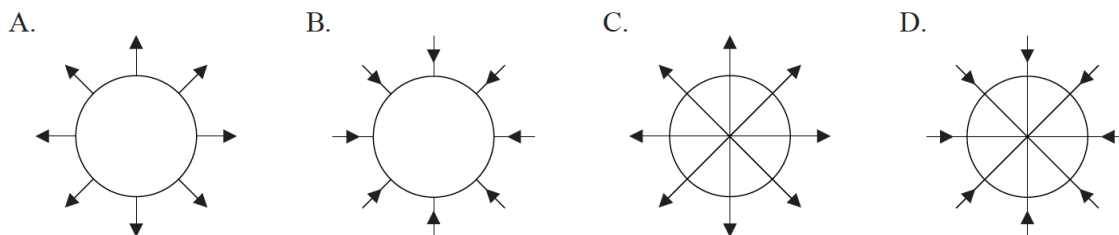
1. Three positive point charges of equal magnitude are held at the corners X, Y and Z of a right-angled triangle. The point P is at the midpoint of XY. Which of the arrows shows the direction of the electric field at point P? [1 mark]



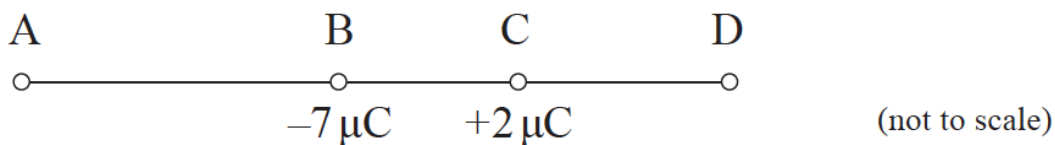
2. Which of the following is the SI unit of gravitational field strength? [1 mark]

- A. N
- B. N m
- C. Nkg^{-1}
- D. $\text{Nm}^2\text{kg}^{-2}$

3. Which of the following is the best representation of the electric field lines around a negatively charged metal sphere? [1 mark]



4. Two isolated point charges, $-7\ \mu\text{C}$ and $+2\ \mu\text{C}$, are at a fixed distance apart. At which point is it possible for the electric field strength to be zero? [1 mark]



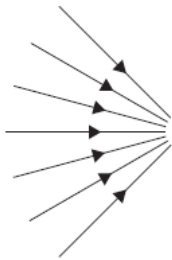
5. A positively charged particle follows a circular path as shown below.

[1 mark]

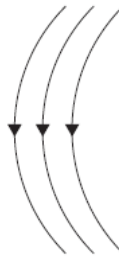


Which of the following electric fields could have caused the charged particle to follow the above path?

A.



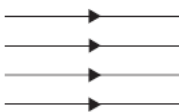
B.



C.

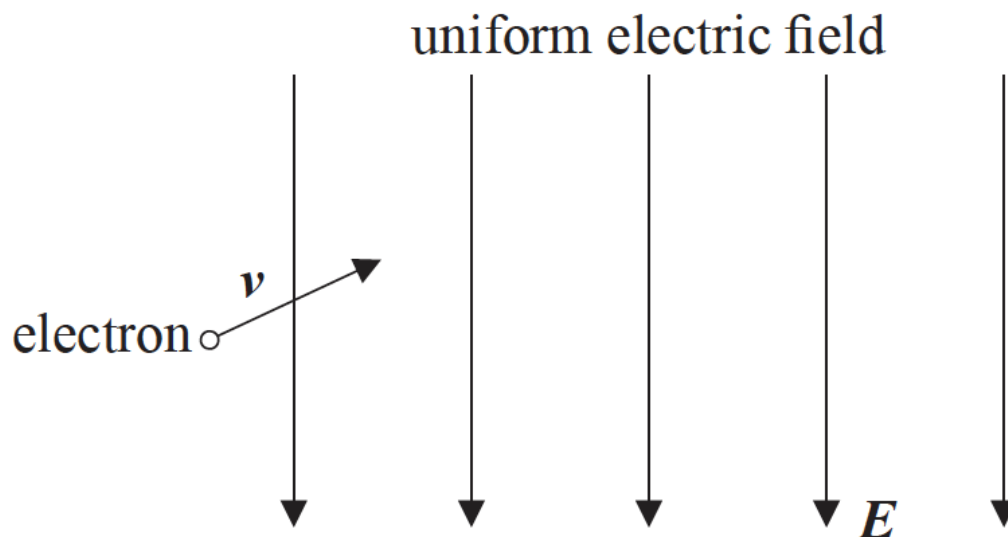


D.



6. The diagram below shows a uniform electric field of strength E . The field is in a vacuum.

[1 mark]



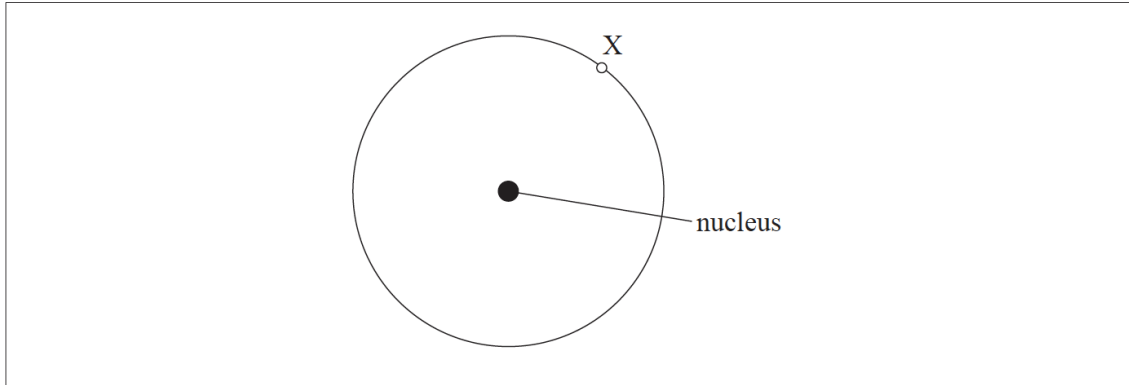
An electron enters the field with a velocity v in the direction shown. The electron is moving in the plane of the paper. The path followed by the electron will be

1. parabolic.
2. in the direction of E .
3. in the direction of v .
4. circular.

This question is in **two** parts. **Part 1** is about the properties of tungsten. **Part 2** is about the properties of a gas.

Part 1 Properties of tungsten

An isolated nucleus of an atom of the metal tungsten contains 74 protons.



Point X is 140 pm from the nucleus.

7. (i) On the diagram above, draw an arrow to show the direction of the electric field at point X. [3 marks]
- (ii) Assuming the nucleus acts as a point charge, determine the magnitude of the electric field strength at point X.

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This question is in **two** parts. **Part 1** is about a lightning discharge. **Part 2** is about fuel for heating.

Part 1 Lightning discharge

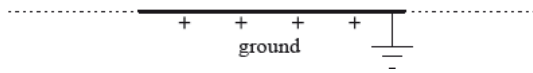
- 8a. Define *electric field strength*. [2 marks]

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8b. A thundercloud can be modelled as a negatively charged plate that is parallel to the ground. [3 marks]



The magnitude of the charge on the plate increases due to processes in the atmosphere. Eventually a current discharges from the thundercloud to the ground.

On the diagram, draw the electric field pattern between the thundercloud base and the ground.