

Brett Robbins Academic Consulting

Physics 30 Practice Test

Unit B: Forces & Fields

5 Questions

Original practice questions written to the Alberta curriculum, in the style of past diploma examinations. Work through each question, then check your answers with the key at the end.

This practice test was made by AI and there may be mistakes. If a question or answer looks wrong, contact Brett for clarification.

Question 1

A point charge of $+2.0 \times 10^{-6} \text{ C}$ and a point charge of $+5.0 \times 10^{-6} \text{ C}$ are separated by a distance of 0.30 m. The magnitude of the electric force that each charge exerts on the other is

- | | |
|-----------|----------|
| A) 0.30 N | B) 1.0 N |
| C) 3.0 N | D) 9.0 N |

Question 2

A test charge of $+2.0 \times 10^{-8} \text{ C}$ experiences an electric force of $3.6 \times 10^{-5} \text{ N}$ at a point in an electric field. The magnitude of the electric field strength at that point is

- | | |
|--------------------------------------|-------------------------------------|
| A) $7.2 \times 10^{-13} \text{ N/C}$ | B) $5.6 \times 10^{-4} \text{ N/C}$ |
| C) $1.8 \times 10^2 \text{ N/C}$ | D) $1.8 \times 10^3 \text{ N/C}$ |

Question 3

Two parallel plates are separated by a distance of 2.0 cm and are connected to a 24 V battery. The magnitude of the electric field between the plates is

- | | |
|----------------------------------|----------------------------------|
| A) 0.48 N/C | B) 12 N/C |
| C) $1.2 \times 10^3 \text{ N/C}$ | D) $2.4 \times 10^3 \text{ N/C}$ |

Question 4

An electron is accelerated from rest through an electric potential difference of 150 V.

The kinetic energy gained by the electron, expressed in units of 10^{-17} J and to three significant digits, is

Question 5

A proton moves at a speed of 4.0×10^5 m/s in a direction perpendicular to a magnetic field of strength 0.25 T. The magnitude of the magnetic force on the proton is

A) 1.6×10^{-14} N

B) 1.6×10^{-13} N

C) 6.4×10^{-14} N

D) 4.0×10^{-19} N

Answer Key

- | | | |
|------|---------|------|
| 1. B | 3. C | 5. A |
| 2. D | 4. 2.40 | |

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