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IGCSE PHYSICS 0625 · TOPICAL PAST PAPERS

Practical Electricity — Paper 1

Worked Answer Key (Multiple Choice)

Fahad H. Ahmad

Contact: +92 323 509 4443

M.Eng NUS Singapore · B.Eng NUST · 15+ years of teaching experience in Singapore, UAE & Pakistan · 60,000+ subscribers and 20 million+ video lecture views.

Fahad H. Ahmad · **+92 323 509 4443**

Practical Electricity — Paper 1 · Worked Answer Key

These are **Megalecture worked answers** for the topical multiple-choice compilation on **Practical Electricity (IGCSE Physics 0625, Paper 1)**. Every answer below was solved from first principles by the Megalecture team. Energy and cost calculations use $E = P \times t$ (in kW·h), cost = units × price per kW·h, and power $P = VI$. Fuse-rating questions are judged on the operating current and on the rule that a fuse must be fitted in the **live** wire. Use this key to mark your work and to see the one-line reasoning behind each correct letter.

Practical Electricity · Questions 1–18

Q #	Exam reference	Answer	Brief working / reason
1	M/J 16 P11	**C**	For safety the **fuse and the switch must both be in the live wire** (left side). Only circuit C has the fuse and the switch on the live side, so the live connection is broken when the fuse blows or the switch opens → **C**.
2	M/J 16 P12	**D**	In a correctly wired plug the fuse sits in the live line between the live pin and the live terminal. Here the live wire L is joined to the **wrong end of the fuse F**, so the fuse is not in series with the live terminal → error **D**.
3	M/J 16 P12	**C**	E = P × t = 0.100 kW × (5 h × 21 days) = 10.5 kW·h. Cost = 10.5 × $0.24 = **$2.52**.
4	M/J 18 P11	**D**	A fuse melts and breaks the circuit if the current becomes too large, so its purpose is to **protect the wiring from overheating** (and from catching fire).
5	M/J 19 P11	**D**	The starter motor needs a very large current (≈100 A), so its leads are short and thick to keep resistance low. The **ignition-switch circuit carries a much smaller current** (1 A), so thin wires are acceptable → **D**.
6	M/J 19 P11	**D**	In a correctly working appliance the operating current flows in and out through the live and neutral; the earth carries no current. So the equal currents are in the **neutral and the live only** → **D**.
7	M/J 19 P12	**C**	Two identical heaters in parallel draw 9 + 9 = 18 A. The fitted 20 A fuse will **not** blow, so 18 A flows in wiring designed for ≈10 A → **the connecting wiring may overheat** (C).
8	M/J 20 P11	**A**	A nail has no current limit, so it cannot break the circuit if a fault occurs. A **very large current can flow and overload the wiring, causing a fire** → **A**.
9	O/N 16 P12	**C**	A fuse breaks the circuit when the current is too large, so it **protects the wiring from overheating** → **C**.

Q #	Exam reference	Answer	Brief working / reason
10	O/N 17 P11	**D**	With P and Q closed and R open: fan motor (0.10 kW) + one heater (0.40 kW) = 0.50 kW. E = 0.50 × 2 = 1.0 kW·h. Cost = 1.0 × 8.0 = **8.0 cents** → **D**.
11	O/N 17 P11	**B**	Earthing the metal case sends fault current safely to earth and keeps the case at 0 V, so it cannot become live: **to ensure the casing is not at a dangerous voltage** → **B**.
12	O/N 18 P11	**A**	E = P × t = 3.0 kW × 2.5 h = 7.5 kW·h, costing 120 c. So 1 kW·h costs 120 ÷ 7.5 = **16 c** → **A**.
13	O/N 18 P11	**A**	With the switch in the live wire, opening it disconnects the live supply, so the **lamp can be isolated from the supply** (it is safe to handle) → **A**.
14	O/N 18 P12	**C**	Energy is sent across long distances at the highest voltage to reduce the current and the power lost in the cables → **a power cable between towns** (C).
15	O/N 19 P11	**A**	Both the switch and the fuse must be in the **live wire** so that the live conductor is broken on switch-off or fuse-blow → row **A** (live, live).
16	O/N 19 P12	**B**	A circuit breaker is fitted in the **live wire**, and when the current is too large it works by an **electromagnet opening a switch** (it does not melt) → row **B**.
17	O/N 20 P11	**D**	Energy in kW·h needs power in kW and time in hours. Power(kW) = **I** × V ÷ 1000, so E = **I** × V × t(hour) ÷ 1000 → **D**.
18	O/N 20 P12	**D**	Final steady power = 8 × 60 = 480 W, so I_{final} = 480 ÷ 240 = 2.0 A. Cold filaments give 4× this: $I_{initial}$ = 4 × 2.0 = **8.0 A** → **D**.

Note from Megalecture. Several items test the same two ideas — a fuse and switch always belong in the *live* wire, and energy cost = power (kW) × time (h) × price per unit. These are original Megalecture worked solutions prepared for revision use.