Practice Question Set For A-Level
Subject : Physics
Paper-1 Topic: Electricity

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Name of the Student:_____
Max. Marks : 21 Marks **Time : 21 Minutes**

Mark Schemes

Q1.

(a) (i) *(use of P=VI)*

I = 36/12 + 6/12 ✓ = 3.5 (A) ✓

2

(ii) *(use of V=IR)*

R = 12/3 = 4 (Ω) ✓

1

(iii) *R* = 12/0.50 = 24 ✓ (Ω)

1

(b) terminal pd/voltage across lamp is now less OR current is less ✓

due to lost volts across internal resistance OR due to higher resistance ✓

lamps less bright ✓

3

(c) (i) current through lamps is reduced as resistance is increased **or**
pd across lamps is reduced as voltage is shared ✓

hence power is less OR lamps dimmer ✓

2

(ii) lamp Q is brighter ✓

lamp Q has the <u>higher resistance</u> hence <u>pd/voltage</u> across is greater ✓

current is the same for both ✓

hence power of Q greater ✓

3

[12]

Q2.

(a) superconductivity means a material has zero resistivity/resistance **(1)**

resistivity decreases with temperature **or** idea of cooling **(1)**

becomes superconducting when you reach the critical/certain/
transition temperature **(1)**

3

(b) (i) (use of $R = \rho l/A$)

$0.075 = \rho \times 1/(2.28 \times 10^{-7})$ **(1)** (must see working or equation)

$R = 1.7 \times 10^{-8}$ **(1)** Ωm **(1)**

(ii) **max 3 from**

the resistance decreases (to zero) **(1)**

copper still has resistance **(1)**

but this is in parallel with filaments (which have zero resistance) **(1)**

hence **total** resistance is zero **(1)**

current goes through filaments **(1)**

6

[9]