

Electric circuits

Mark Scheme 6

Level	IGCSE
Subject	Physics
ExamBoard	CIE
Topic	Electricity and Magnetism
Sub-Topic	Electric circuits
Paper Type	(Extended) Theory Paper
Booklet	Mark Scheme 6

Time Allowed: 47 minutes

Score: /39

Percentage: /100

- 1 (a) changes a.c. to d.c. OR rectifies a/c OR allows current to flow one way only OR prevents current flowing backward B1
- (b) $I \times t$ or 2×12 or $2 \times 12 \times 60 \times 60$ or amps \times seconds C1
 24 Ah or 86 400 C or 86 000 C A
- (c) emf = J/C OR energy converted/work done per unit charge/coulomb C1
 OR W/A OR volts/p.d. when no current in circuit
 12 J of energy are delivered/needed for every coulomb of charge
 OR 12 W is the power to drive a current of 1 A A
- (d) (i) series connection shown, any recognisable symbols B1
- (ii) total power = 16 W OR 8/6 C1
 1.33 A accept fraction c.a.o. A1
- (iii) any power \times any time or $16 \times 60 \times 60$ or IVt or $8 \times 60 \times 60$ C1
 57 600 J or 0.016 kWh or 28 800 J or 0.008 kWh [10]
- 2 (a) connections such that all lamps will light B1
- ammeter in correct position B1
- variable resistor in correct position (condone poor symbol) B1
- switch in appropriate position (could be 2 switches) B1 [4]
- (b) (i) 3 A B1 [1]
- (ii) 4Ω OR 12/his(i) correctly evaluated B1 [1]
- (iii) 2Ω OR $\frac{1}{2} \times$ his(ii) correctly evaluated B1 [1]
- (iv) 1080 J e.c.f. from (i) & (ii) if working shown B1 [1]
- (c) lamps in series M1
- less current/less p.d. (across 1 lamp)/voltage shared/higher resistance A1 [2]
 NOT current shared

[Total: 10]

