

MARK SCHEME ELECTRIC CIRCUITS

Multi Choice

1 B
2 C
3 D
4 A
5 D

6 A
7 B
8 D
9 C
10 D

- 11/ (a) $I = V/R$ or $12/8$
= 1.5 A 1 2
- (b) (i) 10(Ω) 1
- (ii) 2(Ω) 1 2
- (c) power = VI or I^2R or V^2/R
= 72W 1 2
- (d) (i) 12(V) 1
- (ii) 6(V) 1 2
- (e) (i) (resistance) less 1
- (ii) (resistance) less 1 2
- (10)

12/	(a) (i)	to change a.c. to d.c. or rectify (a.c.)	B1	3
	(ii)	full sine wave at least 1.5 full waves half wave rectified at least two d.c. 'bumps'	B1	
(b) (i)	correct symbol	B1	3	
(ii)	when input high or 1, output low or 0 or off	B1		
	when input low or 0 or off, output high or 1 or on	B1		
				[6]

13/10

(a)

Analogue, continuously increasing / decreasing readings
 Digital, readings increase / decrease by one unit

B1
 B1 2

14

X	Y	Z
0	0	1
0	1	0
1	0	0
1	1	0

15

(a) (i) switch, relay or amplifier

(ii) any one of the three versions below, each 2 marks

- 1. vary base current
transistor switches on for $V_{be} > 0.6 \text{ V}$ 1
1
- 2. small change in base current
produces a large change in collector/emitter current 1
1
- 3. vary potential divider connected to transistor base
transistor switches on for $V_{be} > 0.6 \text{ V}$ 1
1 3

(b) (i) standard symbol with 2 inputs and an output labelled 1

(ii) one or both inputs 1, output 1 (accept on, high for 1)
 both inputs 0, output 0 (accept off, low for 0) 1
1 3
(6)

- (a) (i) use of charge = It or $l = 90/45$ C1
 current = 2 A A1
- (ii) resistance = voltage/current or $6/2$ C1
 resistance is 3 ohm A1
- (iii) energy = Vit or Vq or 6×90 C1
 energy is 540 J A1 6
- idea of energy transfer C1
 is (6) J/C A1 2
[8]
- C1