

Name of the Student: _____

Max. Marks : 23 Marks

Time : 23 Minutes

Mark Schemes

Q1.

- (a) potential difference is increased
allow transformer X is a step up transformer 1
- (and) current decreases 1
- (so) energy/power losses in the transmission cables decrease
allow (so) there is less heating in the transmission cables 1
- (b) $11\,000 \times I_s = 400\,000 \times 660$ 1
- $$I_s = \frac{400\,000 \times 660}{11\,000}$$
- 1
- $I_s = 24\,000 \text{ (A)}$ 1
- (c) the street lamps are connected in parallel 1
- (d) resistance (of the LDR) increases
allow resistance (of the circuit) increases 1
- (so) the current decreases
allow so the LDR has a greater (share of the) potential difference 1
- (so) the potential difference across R decreases
dependent on MP1 1
- (e) $20 \text{ mA} = 0.020 \text{ A}$ 1
- $6.0 = 0.020^2 \times R$
allow a correct substitution using an incorrectly / not converted value of current. 1

$$R = \frac{6.0}{\quad}$$

allow a correct re-arrangement using their incorrectly / not converted value of current.

1

$$R = 15000 (\Omega)$$

allow an answer consistent with their incorrectly / not converted value of current

OR

$$20 \text{ mA} = 0.020 \text{ A (1)}$$

$$V = \frac{6.0}{0.020} = 300 \text{ (1)}$$

$$R = \frac{300}{0.020} \text{ (1)}$$

$$R = 15000 (\Omega) \text{ (1)}$$

1

[14]

Q2.

(a) $240 \text{ mW} = 0.24 \text{ W}$

1

$$0.24 = 2.5 \times I$$

allow a correct substitution using an incorrectly/not converted value of power

1

$$I = \frac{0.24}{2.5}$$

allow a correct re-arrangement using an incorrectly/not converted value of power

1

$$I = 0.096 \text{ (A)}$$

allow a correct calculation using an incorrectly/not converted value of power

1

(b) because the potential difference is always positive

allow because potential difference does not change direction

1

(c) potential difference is (directly) proportional to current

1

(d) voltmeter: the reading is the same in both circuits

1

ammeter: the reading in circuit **B** is twice the reading of circuit **A**

allow 1 mark for the reading in circuit **B** is bigger than circuit **A**

