

Practice Question Set For GCSE
Subject : Physics
Paper-1 Topic: Energy (High Demand)

Name of the Student: _____

Max. Marks : 25 Marks

Time : 25 Minutes

Mark Schemes

Q1.

- (a) (i) 5.88 (watts)
an answer of 5.9 scores 2 marks
allow 1 mark for correct substitution ie
$$0.42 = \frac{\text{power out}}{14}$$

allow 1 mark for an answer of 0.0588 or 0.059 2
- (ii) 8.12
allow 14 – their (a)(i) correctly calculated 1
- (b) (i) input power / energy would be (much) less (reducing cost of running)
accept the converse
electricity is insufficient 1
- (also) produce less waste energy / power
accept 'heat' for waste energy 1
- (as the waste energy / power) increases temperature of the cabinet 1
- so cooler on for less time 1
- (ii) line graph
need to get both parts correct
accept scattergram or scatter graph

both variables are continuous
allow the data is continuous 1
- (c) number of bulbs used-halogen=24 (LED=1) 1
- total cost of LED = £30 + £67.20 = £97.20
accept a comparison of buying costs of halogen £36 and LED £30 1
- total cost of halogen= 24 x £1.50 + 24 x £16.00 = £420

or

buying cost of halogen is £36 **and** operating cost is £384

accept a comparison of operating costs of halogen £384 and LED £67.20

allow for 3 marks the difference in total cost is £322.80 if the number 24 has not been credited

1

statement based on correct calculations that overall LED is cheaper

*must be **both** buying **and** operating costs*

an alternative way of answering is in terms of cost per hour:

buying cost per hour for LED $\left(\frac{£30.00}{48000}\right) = 0.0625\text{p}/£0.000625$

buying cost per hour for halogen = $\left(\frac{£1.50}{2000}\right) = 0.075\text{p}/£0.00075$

a calculation of both buying costs scores 1 mark

operating cost per hour for LED = $\left(\frac{£67.20}{48000}\right) = 0.14\text{p}/£0.0014$

operating cost per hour for halogen = $\left(\frac{£16.00}{2000}\right) = 0.8\text{p}/£0.008$

a calculation of both operating costs scores 1 mark

all calculations show a correct unit

***all** units correct scores 1 mark*

statement based on correct calculations of **both** buying **and** operating costs, that overall LED is cheaper

correct statement scores 1 mark

1

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Q2.

- (a) water heated by radiation (from the Sun)

accept IR / energy for radiation

1

water used to heat buildings / provide hot water

allow for 1 mark heat from the Sun heats water if no other marks given

references to photovoltaic cells / electricity scores 0 marks

1

- (b) 2 (minutes)

$$1.4 \times 10^3 = \frac{168 \times 10^3}{t}$$

gains 1 mark

calculation of time of 120 (seconds) scores 2 marks

3

- (c) (i) 150 (kWh)

1

- (ii) £60(.00) or 6000 (p)

an answer of £6000 gains 1 mark
allow 1 mark for $150 \times 0.4(0)$ 150×40
allow ecf from (c)(i)

2

(iii) 25 (years)

an answer of $6000 / 240$

or

$6000 / \text{their (c)(ii)} \times 4$
gains 2 marks

an answer of $6000 / 60$

or

$6000 / \text{their (c)(ii)}$ gains 1 mark, ignore any other multiplier of (c)(ii)

3

(iv) any **one** from:

- will get £240 per year
accept value consistent with calculated value in (c)(iii)
- amount of light is constant throughout the year
- price per unit stays the same
- condition of cells does not deteriorate

1

(d) any **one** from:

- angle of tilt of cells
- cloud cover
- season / shade by trees
- amount of dirt

1

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