Practice Question Set For GCSE
**Subject : Physics**
**Paper-2 Topic : 8_Energy Forces Doing Work**

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

Mark Schemes

**Q1.**

| Question number | Answer | Additional guidance | Mark |
|---|---|---|---|
| i | a description to include **two** clear statements of what is measured plus further details<br><br>use scales / a balance to measure mass(es) (1)<br><br>use a (metre) rule to measure a distance / height (1)<br><br>PLUS any **two** from<br><br>set balance to zero / tare (before placing masses) (1)<br><br>measure initial and final heights (1) | marks may be scored from the diagram<br><br>allow counts up the total mass on the hanger<br><br>allow use newton meter / scale / balance to measure weight<br><br>allow ruler / measuring tape<br>ignore metre stick | **(4)**<br>**AO1.2** |
| | use of same reference point for height measurements (1)<br><br>clamp vertical rule / detail of checking rule is vertical (1)<br><br>selects GPE = m g (Δ)h (1) | e.g. top of masses<br><br>(GPE =) work done = weight x distance | |

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| Question number | Answer | Additional guidance | Mark |
|---|---|---|---|
| ii | rearrangement and substitution (1)<br><br>$\frac{5.8}{320\ (\times 10^{-3}) \times 10}$<br><br>evaluation (1)<br><br>1.8 (m) | <br><br>$\frac{5.8}{0.320 \times 10}$<br><br>any number rounding to 1.8 e.g. 1.8125<br><br>award full marks for the correct answer without working | **(2)**<br>**AO2.1** |

| Question number | Answer | Additional guidance | Mark |
|---|---|---|---|
| iii | award **one** mark for any stated reason from:<br><br>friction (in the motor) (1)<br><br>heating (electrical or from frictional effects) (1) | other valid answers possible<br><br>allow 'it needs oiling' etc.<br><br>to thermal (energy store) / energy transferred to surroundings / energy dissipated<br><br>allow it gets hot<br><br>ignore sound | **(1)**<br>**AO1.1** |

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**Q2.**

| Question Number | Answer | Additional guidance | Mark |
|---|---|---|---|
| | An answer that includes<br><br>**difference** in energy transferred / work done (when loading and unloading) (1)<br><br>transferred to thermal energy (store in the rubber) (1) | <br><br><br><br><br>(thermal) energy is dissipated to the surroundings | **(2)** |

**Q3.**

| | Answer | Acceptable answers | Mark |
|---|---|---|---|
| **(a)** | transformer | Step-up transformer<br>Step-down transformer | **(1)** |
| **(b)** | A suggestion to include any 2 of the following<br>• (LED) turns on and off<br>• as voltage/current changes direction/from +ve to –ve/ twice each second (1)<br>• (LED) on for (+ve ) part of cycle (1)<br>• (LED) off for (-ve) part of cycle (1) | Flash(es) / flicker(s) (on and off) current changes every 0.25 s /4 times each second<br>Turns on twice each second = 2 marks<br>Only on when voltage/current is +ve gains both marks | **(2)** |
| **(c)** | substitute (1)<br>3 = I × 12<br>transformation (1)<br>I = 3 ÷ 12 evaluation (1)<br>0 .25 (A) Ignore any unit given by candidate | Subst. and transform. either order<br>1 mark only can be scored for correct substitution after incorrect transposition. Accept any number of sig. figs. that rounds to 0.25 (A) 250 mA gains 3 marks give | **(3)** |

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|---|---|---|---|
| | | full marks for correct answer, no working<br>2.5 × any other power of ten = 2 marks eg 25 (A) gains 2 marks | |

| | | Indicative Content | Mark |
|---|---|---|---|
| **QWC** | ***(d)** | A discussion including some of the following points<br>• improved lighting levels for LEDs<br>• energy savings per year for LEDs or calculation of payback time<br>• calculation of energy savings over lifetime of LEDs or calculation of monetary savings by using LEDs per year<br>• link to savings in fossil fuels for LEDs or link to reduced $CO_2$ produced for LEDs and reduced global warming<br>• comparison of lifetimes and maintenance cost | **(6)** |
| **Level** | **0** | No rewardable content | |
| **1** | **1 - 2** | • a limited discussion of benefits using some pieces of the information provided, e.g. LEDs last 40 000 hours longer and the lighting levels are 200% brighter.<br>• the answer communicates ideas using simple language and uses limited scientific terminology<br>• spelling, punctuation and grammar are used with limited accuracy | |
| **2** | **3 - 4** | • a simple discussion of benefits using some pieces of the information and processing one of them OR 2 processed pieces of information. e.g. LEDs save 3000 kW h of energy each year and are much brighter. The money they save each year compared to fluorescents is £420. OR The payback time for the LEDs is about 5 years and in that time they would have to pay for the fluorescent lights to be replaced 5 times.<br>• the answer communicates ideas | |

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|---|---|---|
| | | showing some evidence of clarity and organisation and uses scientific terminology appropriately<br>• spelling, punctuation and grammar are used with some accuracy |
| **3** | **5 - 6** | • a detailed discussion of benefits using processed information covering more than half of the data points in the table e.g. LEDs use less energy each year and this means that fossil fuel reserves are not used up as quickly. The LEDs save £420 each year and have a payback time of about 5 years.<br>• the answer communicates ideas clearly and coherently uses a range of scientific terminology accurately<br>• spelling, punctuation and grammar are used with few errors |

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