Student Name:_____

PHYSICS

Unit 4
Targeted Evaluation Task for School-assessed Coursework 2

2013 Test on Electric power for Outcome 1

Recommended writing time: 60 minutes*
Total number of marks available: 40 marks

TASK BOOK

* The recommended writing time is a guide to the time students should take to complete this task. Teachers may wish to alter this time and can do so at their own discretion.

Conditions and restrictions

- Students are permitted to bring into the room for this task: pens, pencils, highlighters, erasers, sharpeners and rulers and up to two pages (one A4 sheet) of pre-written notes (typed or handwritten) and one scientific calculator.
- Students are NOT permitted to bring into the room for this task: blank sheets of paper and/or white out liquid/tape.

Materials supplied

- Question and answer booklet of 8 pages containing 17 questions. A formula and data sheet.

Instructions

- Print your name in the space provided at the top of the front page.
- Unless otherwise indicated, the diagrams in this task are **not** drawn to scale.
- All written responses must be in English.
- Where an answer box has a unit printed in it, give your answer in that unit.
- In questions where more than one mark is available, appropriate working should be shown.

Students are NOT permitted to bring mobile phones and/or any other unauthorised electronic devices into the room for this task.

Physics Unit 4 – Formula Sheet

1	photoelectric effect	$E_{k_{max}} = hf - W$
2	photon energy	$E = hf$
3	photon momentum	$p = \frac{h}{\lambda}$
4	de Broglie wavelength	$\lambda = \frac{h}{p}$
5	resistors in series	$R_T = R_1 + R_2$
6	resistors in parallel	$\frac{1}{R_T} = \frac{1}{R_1} + \frac{1}{R_2}$
7	magnetic force	$F = IlB$
8	electromagnetic induction	$emf: \varepsilon = -N\frac{\Delta\Phi}{\Delta t}$
9	transformer action	$\frac{V_1}{V_2} = \frac{N_1}{N_2}$
10	AC voltage and current	$V_{RMS} = \frac{1}{\sqrt{2}}V_{peak} I_{RMS} = \frac{1}{\sqrt{2}}I_{peak}$
11	voltage; power	$V = IRP = VI$
12	transmission losses	$V_{drop} = I_{line}R_{line} P_{loss} = I_{line}^2 R_{line}$
13	mass of electron	$m_e = 9.1 \times 10^{-31}\ kg$
14	charge on the electron	$e = {}^{-}1.6 \times 10^{-19}\ C$
15	Planck's constant	$h = 6.63 \times 10^{-34}\ Js$ $h = 4.14 \times 10^{-15}\ eVs$
16	speed of light	$c = 3.0 \times 10^8 ms^{-1}$
17	acceleration due to gravity at Earth's surface	$g = 10\ ms^{-2}$

Prefixes/Units

p = pico = 10^{-12}
n = nano = 10^{-9}
μ = micro = 10^{-6}
m = milli = 10^{-3}
k = kilo = 10^{3}
M = mega = 10^{6}
G = giga = 10^{9}
t = tonne = 10^{3} kg