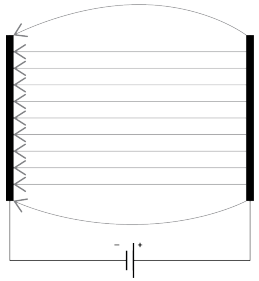
Assessment Schedule – 2019

Physics: Demonstrate understanding of electricity and electromagnetism (91173)

Evidence Statement

Q	Evidence	Achievement	Merit	Excellence
ONE (a)	$I = \frac{V}{R} = \frac{4}{5} = 0.8$ A	• Show question.		
(b)	$P = \frac{E}{t}$ so $E = 0.8 \times 11 \times 120 = 1056$ Joules	• Correct power =8.8W • Finds E by using $t = 2$ (17.6 J). • Or any **power** multiplied by 120	• Correct answer.	
(c)	$\left(\frac{1}{6+5.6} + \frac{1}{3.2}\right)^{-1} = 2.51\,\Omega$	• Finds 11.6. Or has $\frac{1}{3.2}$. **Not** 6 + 5.6 + 3.2	• Correct answer.	
(d)	Power determines brightness. By adding the extra lamp to Circuit 2, the total resistance of the circuit has decreased. This means the current in the circuit has increased, as the circuit voltage has remained the same. $P = IV$, so because the current has increased, so has the power of Circuit 2, meaning that Circuit 2 is brighter.	• One correct statement. **Not** just circuit 2 is brighter.	• Two correct statements.	• Comprehensive answer that must state circuit 2 is brighter or equivalent. Specific example ok eg assigning a number for r to the bulbs and calculating power.

Q	Evidence	Achievement	Merit	Excellence
TWO (a)	$E = \frac{V}{d} = \frac{550 \times 10^3}{1.2} = 4.6 \times 10^5$ V m^{-1}	• Correct answer.		
(b)	$E = \frac{1}{2}mv^2 = Eqd$ Double v means 4 × the kinetic energy, which means 4 × the stopping distance as E, q and m constant.	• Distance increases. Includes distance doubles.	• 4 times the stopping distance.	
(c)		• At least one arrow showing correct field direction.	• Correct answer.	
(d)	$\frac{1}{2}mv^2 = Eqd$ $\Rightarrow \frac{1}{2} \times 0.13v^2 = 4.6 \times 10^5 \times 3.5 \times 10^{-6} \times 1.2$ $v = 5.45$ m s^{-1}	• Made one valid step to the solution.	• One error. .	Correct answer- allowing for incorrect part a.

Q	Evidence	Achievement	Merit	Excellence
THREE (a)	$V = BvL = 4.73\times10^{-6}\times13.5\times0.42$ $= 2.68\times10^{-4}$ V Show question.	Show question Accept use of 42		
(b)	The electrons are cutting the magnetic field as the handlebars move. There is a force on the electrons that causes a charge separation. The two ideas are movement across field and charge separation. Not "**in or entering** a magnetic field"	• ONE of: - **Movement** across B. - Charge separation.	• Both.	
(c)(i) (ii)	Voltage is less. Because the component of the velocity at 90° to the magnetic field has decreased. Must refer to movement.	• Induced voltage is less.	• Correct answer to (i) and a valid reason. E.g. horizontal speed less. • Crosses field lines slower. OR similar.	
(d)	$V = BvL = 0.8\times1.2\times3.1 = 2.976$ $V = IR$ so $I = 0.5952$ and $F = BIL = 0.8\times0.5952\times1.2 = 0.571$ N	• Correct voltage. Or Uses 1.5m twice (0.89N)	• One error, uses L = 1.5 once (0.714N)	• Correct answer. 0.571N

Cut Scores

Not Achieved	Achievement	Achievement with Merit	Achievement with Excellence
0 – 7	8 – 14	15 – 19	20 – 24