SMJK YU HUA
MID YEAR EXAMINATION 2015
MARKING SCHEME

Subject : Physics Paper 2
Form : 4A – 4F
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Answers	Marks
Section A	
1 a) 2450×10^{-6} s / 2.45×10^{-3} s 2450×10^{-6} s / 2.45×10^{-3} s.	1 1
b) 0.98×10^{-3} A / 9.80×10^{-4} A 0.98×10^{-3} A / 9.80×10^{-4} A	1 1
c) 352×10^{-27} m^3 / 3.52×10^{-25} m^3 352×10^{-27} m^3 / 3.52×10^{-25} m^3	1 1
d) 38×10^{6} m^2 / 3.8×10^{7} m^2 38×10^{6} m^2 / 3.8×10^{7} m^2	1 1
2 a) $7.0 \times 10^{-9} \times 10^{6}$ W / 7.0×10^{-3} W $7.0 \times 10^{-9} \times 10^{6}$ W / 7.0×10^{-3} W	1 1
b) $3.45 \times 10^{5} \times 10^{9}$ V / 3.45×10^{14} V $3.45 \times 10^{5} \times 10^{9}$ V / 3.45×10^{14} V	1 1
c) $9.87 \times 10^{4} \times 10^{-6}$ C / 9.87×10^{-2} C $9.87 \times 10^{4} \times 10^{-6}$ C / 9.87×10^{-2} C	1 1
d) $\frac{534 \times 10^{-9}\ \text{J}}{60 \times 60\ \text{s}} = 1.483 \times 10^{-10}\ \text{Js}^{-1}$ $\frac{534 \times 10^{-9}\ \text{J}}{60 \times 60\ \text{s}} = 1.483 \times 10^{-10}\ \text{Js}^{-1}$	1 1
e) $\frac{736 \times 10^{-3}\ \text{A}}{60\ \text{s}} = 1.23 \times 10^{-2}\ \text{As}^{-1}$ $\frac{736 \times 10^{-3}\ \text{A}}{60\ \text{s}} = 1.23 \times 10^{-2}\ \text{As}^{-1}$	1 1

3) a) constant velocity b) 12 ticks × 0.02s = 0.24 s c) 11.5 cm 11.8 cm d) average velocity = 11.5 cm / 0.24 s = 47.92 cms^{-1} 49.16 cms^{-1}	1 1 1 1 1 1
4) a) u = 25 cms^{-1} v = 150 cms^{-1} $a = \frac{150\ \text{cms}^{-1} - 25\ \text{cms}^{-1}}{5 \times 0.2\ \text{s}}$ = 125 cms^{-2} 17.5 cms^{-2} u = 7.5 cms^{-1} v = 25 cms^{-1} a = 17.5 cms^{-2}	1 1 1
b) total displacement = 5cm+ 10 cm + 15cm + 20 cm + 25 cm + 30 cm = 105.0 cm s = 19.9 cm	1 1
c) average velocity = $\frac{\text{total displacement}}{\text{total time taken}}$ = 105.0 cm / 1.2 s = 87.5 cms^{-1} $= \frac{19.9}{1.2} = 16.58$ cms^{-1}	1 1

5.				
(a)(i)	•	Sensitivity is the ability of a measuring instrument to detect the change of the quantity to be measured. If the instrument can detect a very small change, the instrument is said to be sensitive.		1
	•	Accuracy of a measurement is the degree of closeness of the measured value from the actual value.		-
(ii)	•	Vernier callipers has an accuracy of 0.1 mm and micrometer screw gauge has an accuracy of 0.01 mm.		1
	•	Micrometer screw gauge has a higher sensitivity than vernier callipers because micrometer screw gauge can detect a smaller change in length.		1
(iii)	•	Zero error in an instrument will cause the measurement to be inaccurate.		1
	•	It will cause the measurement to deviate from the actual value by a certain amount.		1
(b)	(i)	Zero error	= 0.01 mm	1
	(ii)	Diameter	= (main scale value + vernier scale value) – zero error = 1.79 – (0.01) = 1.80 mm	2
6) a) vernier callipers				
b) i) 220.0 g				1
b) ii) random error				1

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