



**General Certificate of Secondary Education**

**Separate Science Physics 4451**

**PHY3F Unit Physics 3**

**Mark Scheme**

*2008 examination - January series*

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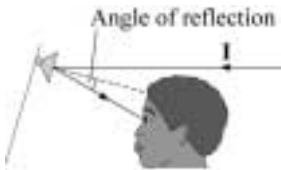
**PHY3F**

**Question 1**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	centre of X at the point where the axes cross	to within 1 mm in any direction	1
(b)(i)	(at / in the) centre (of the tyre)	<b>or</b> unambiguously shown on the diagram	1
(ii)	(this is) where axes of symmetry (of the tyre) cross / intersect / meet	<b>or</b> point at which the mass of the tyre seems to be (concentrated)	1
total			3

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**Question 2**

question	answers	extra information	mark
(a)(i)	I correct r correct	only credit if unambiguously correct ously correct 	1 1
(ii)	(the) normal	do <b>not</b> credit 'perpendicular' / 'vertical'	1
(b)	both lines correctly connected one line correctly connected gains <b>1</b> mark	if two lines from any in list A to any in list B then both incorrect	2
total			5

**PHY3F****Question 3**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	tension	accept any unambiguous method of indication eg it's underlined <b>or</b> ticked	1
(b)(i)	speed of the ball is increased		1
(b)(ii)	the direction of the ball		1
(c)	centripetal	accept any unambiguous method of indication eg it's underlined <b>or</b> ticked	1
total			4

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**Question 4**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)(i)	more than	accept any clear indication eg the other two lines crossed out	1
(ii)	less than	accept any clear indication eg the other two lines crossed out	1
(b)	any <b>two</b> from: <ul style="list-style-type: none"> <li>• above the equator</li> <li>• takes / period of 24 hours</li> <li>• (remains) above the same point</li> </ul>	<p><b>or</b> 'rotates with the Earth' do <b>not</b> credit 'stays in the same place' but accept '<u>appears</u> to stay in the same place'</p> <p>do <b>not</b> credit just 'one like satellite X's'</p>	2
(c)	<u>low</u> polar		1
total			5

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**Question 5**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	Venus	accept Mercury	1
(b)	any negative number or range in the range -75 to -150 inclusive	do <b>not</b> credit any positive number or positive range	1
(c)	<b>either</b> ... increases ... increases <b>or</b> ... decreases ... decreases	<b>both</b> required for the mark	1
(d)	Today's ..... about Mars.	accept any unambiguous method of indication for the correct answer eg it's underlined or ticked	1
total			4

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**Question 6**

question	answers	extra information	mark
(a)	increase the current (1)	credit increase the p.d./voltage credit reduce the resistance credit have thicker wiring credit add extra / more cells	1
	increase the magnetic field (strength) (1)	credit 'have stronger magnet(s) do <b>not</b> credit 'bigger magnets'  <b>either order</b>	1
(b)	<b>either</b> reverse polarity <b>or</b> connect the battery the other way round	do <b>not</b> give any credit to a response in which both are done at the same time  <b>either order</b>	1
	<b>either</b> reverse direction of the magnetic field <b>or</b> put the magnet the other way round / reverse the magnet		1
(c)	<b>either</b> conductor parallel to the magnetic field <b>or</b> lines of magnetic force and path of electricity do not cross		1
total			5



**PHY3F****Question 7**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	converging <b>or</b> convex		1
(b)	(principal) focus <b>or</b> focal point		1
(c)	<b>either</b> ( $\times$ )1.5 <b>or</b> ( $\times$ )1½ <b>or</b> 150%	unambiguous evidence of appropriate measurements for <b>1</b> mark only eg 4 and 6 <b>or</b> 8 and 12 <b>or</b> 0.8 and 1.2	2
(d)	real rays cross to form it / formed at the intersection of real rays	accept 'image on the opposite side of the lens to the object' accept 'can be put onto a screen'	1
total			5

**PHY3F**

**Question 8**

<b>question</b>	<b>answers</b>	<b>extra information</b>	<b>mark</b>
(a)	moment	<b>or</b> torque do <b>not</b> credit 'leverage'	1
(b)	4 (2)	<b>either</b> 0.20 × 20 (1) <b>or</b> allow '400' (1)	2
(c)	use a longer spanner <b>or</b> 'fit a pipe over the (end of the) spanner (to lengthen it)'  use a greater force / pull	<b>or</b> increases the perpendicular distance / length  note 'lever' refers to 'spanner' note <u>change</u> the . . . (0) ignore references to wider / larger nut  <b>either order</b>	1      1
total			5