

# SECONDARY SCHOOLS TRACK 3 ANNUAL EXAMINATIONS 2012

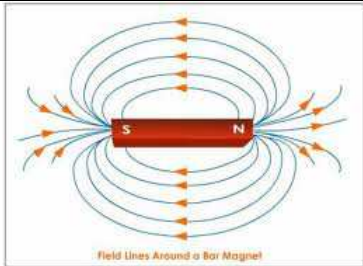
Directorate for Quality and Standards in Education

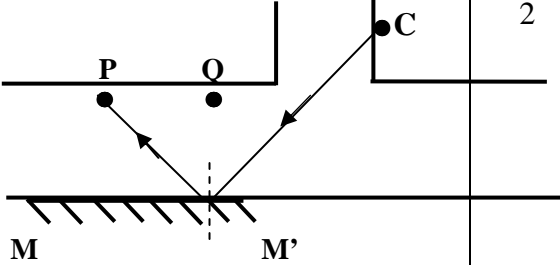
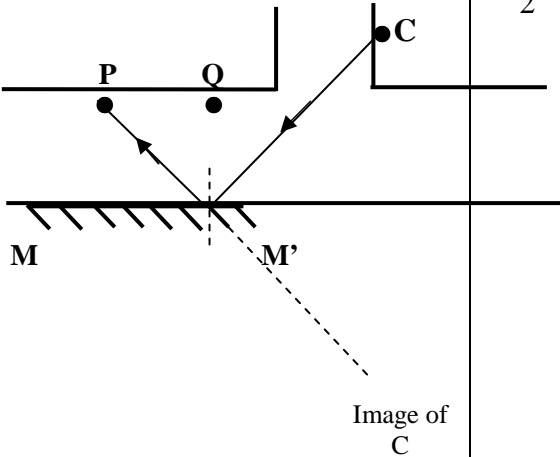
Educational Assessment Unit

**FORM 5**

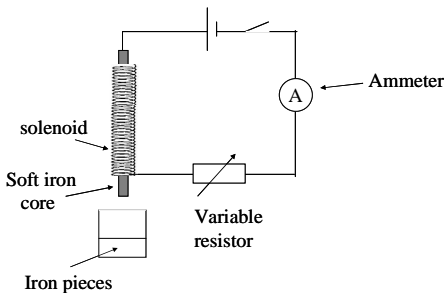
**PHYSICS**

**MARKING SCHEME**

<b>SECTION A</b>			<b>70 MARKS</b>
Question	Answer	Mark	Additional Guidelines
1. a. i.	Vector	1	
1. a. ii.	Scalar	1	
1. b. i.	120 s	2	Accept '120'
1. b. ii.	90 m	2	1 mark for correct unit
1. c. i.	No	1	
1. c. ii.	Yes	1	
1. c. iii.	The direction of velocity changes	2	Accept any similar answer
2. a. i.	solids; liquids; gases	1,1,1	
2. a. ii.	kinetic	2	
2. a. iii.	decreases	1	
2. b. i.	heated	1	
2. b. ii.	cooled	1	
2. c.	evaporation; boiling point	1,1	
3. a.	C at the point where diagonals of PQ bisect each other	1	Accept other relevant answer
3. b. i.	0.6 m <sup>3</sup>	2	1 mark for correct unit
3. b. ii.	2400 kg/m <sup>3</sup>	2	1 mark for correct unit
3. c. i.	14400 N	2	1 mark for correct unit
3. c. ii.	36000 Pa or 36000 N/m <sup>2</sup>	3	1 mark for correct unit
4. a. i.	attracted	1	
4. a. ii.	steel; iron	1,1	Accept any other correct answer
4. b.		1  2	Correct shape of field  Correct direction of field lines
4. c. i.	North	2	Accept magnetic North Pole
4. c. ii.	To determine magnetic polarity	2	Accept any other correct use
5. a. i.	voltmeter	1	
5. a. ii.	ammeter	1	
5. a. iii.	switch	1	
5. b. i.	6 Ω	1	Accept '6'
5. b. ii.	2 A	2	1 mark for correct unit
5. b. iii.	24 W or 24 J/s	2	1 mark for correct unit
5. c.	1.5 Ω	2	1 mark for correct answer

Question	Answer	Mark	Additional Guidelines
6. a. i.	nucleus	1	
6. a. ii.	protons; neutrons	1,1	
6. a. iii.	isotopes	1	
6. b.	92, 146, 92	1,1,1	
	92, 143, 92	1,1,1	
7. a. i.		2	Give 1 if direction of ray is not indicated or is incorrect
7. a. ii.	Normal drawn correct	1	
7. a. iii.	$i = r$	1	
7. b.		2	
7. c. i.	image distance equals object distance	1	
7. c. ii.	virtual	1	
7. d.	image is laterally inverted	1	
7. e.	light from C is not reflected to Q	1	

SECTION B			100 MARKS
Question	Answer	Mark	Additional Guidelines
8. a.	An empty beaker is measured on a weighing balance	1	
	An amount of water is poured into a beaker	1	
	The new mass of the beaker and water is measured	1	
	The 2 <sup>nd</sup> reading less the 1 <sup>st</sup> reading gives the mass of the water only	1	
8. b. i.	Straight line through origin	6	1 mark for graph title. 2 marks for correct labelling of axes. 2 marks for correct plotting 1 mark for correct size of graph
8. b. ii.	4.9 N	2	Accept '4.9'
8. c.	$9.8 \pm 0.2 \text{ N/kg}$ or $9.8 \pm 0.2 \text{ m/s}^2$	4	3 marks for correct working 1 mark for correct unit
8. d.	W directly proportional to m	1	
	Graph is a straight line passing through origin	1	
8. e.	W is a dependent variable and dependent variables are always plotted on y-axis	2	
9. a. i.	space	1	
9. a. ii.	planets; moons	1,1	Accept 'satellites' Do not accept 'asteroids' or 'comets'
9. a. iii.	gravity; sun	1,1	
9. b. i.	Sun	1	Proxima Centauri or any other name of a sun
9. b. ii.	Moon	1	
9. b. iii.	Any planet	1	
9. c. i.	8	1	
9. c. ii.	Pluto	1	
9. c. iii.	dwarf	1	
9. c. iv.	its orbit not free of other masses	2	
9. d.	True - ii; iii; iv; v.	7	
	False - i; vi; vii.		
10. a. i.	Acceleration / increase in velocity	1	
10. a. ii.	Constant velocity / speed	1	
10. b. i.	Time between seeing the lights changing colour to pressing the brakes	2	Accept similar replies
10. b. ii.	She was tired / on her mobile / distracted	1	Accept similar replies
10. c.	A straight line is drawn from D to the x-axis at time = 12 s	2	
10. d. i.	15 m	2	1 mark for using area of graph 1 mark for correct answer
10. d. ii.	30 m	2	1 mark for using area of triangle

			1 mark for correct answer
<b>10. d. iii.</b>	45 m	1	Accept '45'
<b>10. e. i.</b>	0 kgm/s	2	1 mark for correct unit
<b>10. e. ii.</b>	15 000 kgm/s	2	Accept '15 000'
<b>10. e. iii.</b>	$F = m a$ $= 1000 \times 3.75$ $= 3750 \text{ N}$	2 2	Correct working of deceleration / change in momentum Correct answer
<b>11. a. i.</b>	Smooth curves starting from 90°C	1,1	
<b>11. a. ii.</b>	90°C	1	
<b>11. a. iii.</b>	Beaker A - 80°C; 10°C Beaker B - 70°C; 20°C	1,1 1,1	
<b>11. a. iv</b>	$Q = m c \Delta\theta$ $= 10,500 \text{ J or } 10.5 \text{ kJ}$	3	1 mark for correct unit
<b>11. b.</b>	able to take very frequent readings / more accurate readings	2	Any other correct answer
<b>11. c. i.</b>	Beaker B	1	
<b>11. c. ii.</b>	black colour is a better emitter of heat than silver	2	
<b>11. c. iii.</b>	conduction; radiation	1,1	
<b>11. c. iv.</b>	convection	1	
<b>11. d.</b>	Temperature of water in both beakers drops to room temperature	2	
<b>12. a. i.</b>		4	2 marks - correct diagram 2 marks - labels
<b>12. a. ii.</b>	One solenoid is connected and switch is closed The number of pins attracted is counted Experiment is repeated with more turns of wire A graph is plotted of number of turns of coil vs number of pins attracted	1 1 1 1	
<b>12. a. iii.</b>	Current in circuit	2	
<b>12. a. iv.</b>	Repeated readings / switch circuit on only when taking readings /	1,1	Any other reasonable precaution
<b>12. b. i.</b>	The number of turns of wire is directly proportional to the strength of the magnetic field	2	
<b>12. b. ii.</b>	120 nails	2	

<b>12. b. iii.</b>	The magnetic field will be weaker	2	
<b>12. b. iv.</b>	Current passing through the solenoid	2	