

SECONDARY SCHOOLS TRACK 2 ANNUAL EXAMINATIONS 2012

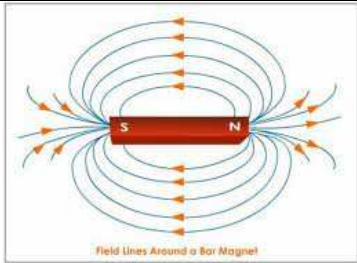
Directorate for Quality and Standards in Education

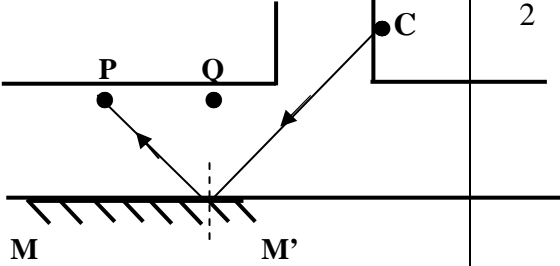
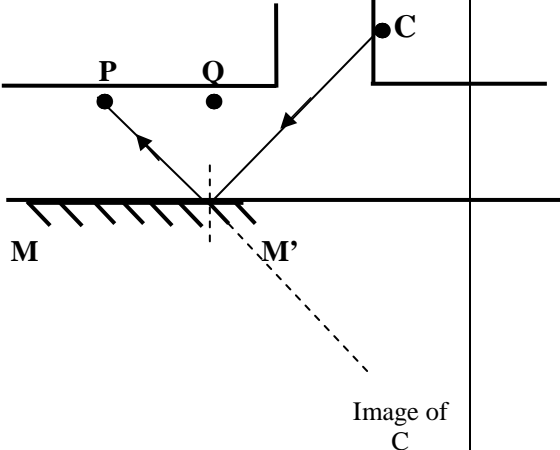
Educational Assessment Unit

FORM 5

PHYSICS

MARKING SCHEME

SECTION A			70 MARKS
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 answers
3. b. i.	0.6 m ³	2	1 mark for correct unit
3. b. ii.	2400 kg/m ³	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 ²	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 working

Question	Answer	Mark	Additional Guidelines
			1 mark for correct answer
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.	Diagram of a beaker	1	
	Label of a beaker	1	
	Diagram of a digital balance / weighing equipment	1	
	Label of a digital balance / weighing equipment	1	
8. b.	An empty beaker is measured on a weighing balance	1	Accept any other suitable answer
	The mass of the beaker and water is measured	1	
	The 2 nd reading less the 1 st reading gives the mass of the water only	1	
8. c. i.	Correct graph	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. c. ii.	1.2 ± 0.2 kg	1	
8. d.	W directly proportional to m. Graph is a straight line passing through origin	1 1	
8. e.	W = mg = 18 N	2	1 mark for correct unit
8. f.	No	1	
	The value of 'g' depends upon the size of the planet / is greater on Earth than on the Moon	1	
9. a. i.	space	1	
9. a. ii.	galaxies; solar systems; planets	1,1,1	
9. a. iii.	gravity	1	
9. a. iv.	Sun	1	
9. a. v.	Moon	1	
9. a. vi.	Earth	1	
9. b. i.	8	1	
9. b. ii.	Mercury	1	
9. b. iii.	Pluto	1	
9. b. iv.	dwarf	1	
9. b. v.	Light year	1	
9. c. i.	False	1	
9. c. ii.	True	1	
9. c. iii.	True	1	
9. c. iv.	True	1	
9. c. v.	True	1	
9. c. vi.	False	1	
9. c. vii.	False	1	
10. a. i.	10 m/s	1	

10. a. ii.	15 m/s	1													
10. a. iii.	3 s	1													
10. b. i.	Acceleration	2													
10. b. ii.	Constant / uniform velocity	2													
10. c. i.	Time between seeing the lights changing colour to pressing the brakes	2	Accept similar replies												
10. c. ii.	She was tired / on her mobile / distracted	1	Accept similar replies												
10. d.	A straight line is drawn from D to the x-axis at time = 12 s	2	1 mark if the graph crosses the x-axis at a different time but deceleration is clearly intended												
10. e. i.	0 kgm/s	2	1 mark for correct unit												
10. e. ii.	15 000 kgm/s	2	Accept '15 000'												
10. e. iii.	$F = (mv - mu)/t$ $= (15000 - 0)/4$ $= 3750 \text{ N}$	2 2	Correct inputting of values in formula Correct answer												
11. a. i.	90°C	1													
11. a. ii.	12 minutes	1													
11. a. iii.	65 - 45 = 20°C	2													
11. a. iv.	B	1													
11. a. v.	Black	2													
11. a. vi.	Conduction - Yes Convection - No Radiation - Yes	1 1 1													
11. a. vii.	Repeated readings / water is stirred continually to have a uniform temp	1,1	Any other sensible precaution												
11. b.	able to take very frequent readings / more accurate readings	2	Any other correct answer												
11. c.	Temperature of water in both beakers drops to room temperature	2													
11. d. i.	5°C	1													
11. d. ii.	$Q = m c \Delta\theta$ $= 10,500 \text{ J or } 10.5 \text{ kJ}$	3	1 mark for correct units												
12. a. i.	<table border="1"> <tbody> <tr> <td>The apparatus was set up as shown in the above diagram</td> <td>1</td> </tr> <tr> <td>Experiment was repeated with more turns of wire</td> <td>5</td> </tr> <tr> <td>The number of pins attracted was counted</td> <td>4</td> </tr> <tr> <td>The number of turns of wire were counted</td> <td>2</td> </tr> <tr> <td>A graph was plotted of number of turns of coil vs number of pins attracted</td> <td>6</td> </tr> <tr> <td>The switch was closed</td> <td>3</td> </tr> </tbody> </table>	The apparatus was set up as shown in the above diagram	1	Experiment was repeated with more turns of wire	5	The number of pins attracted was counted	4	The number of turns of wire were counted	2	A graph was plotted of number of turns of coil vs number of pins attracted	6	The switch was closed	3	5	Give 3 marks if only a couple of values are wrong.
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12. a. ii.	Current in the circuit	2	
12. b. i.	The number of turns of wire is directly proportional to the strength of the magnetic field	2	
12. b. ii.	120 nails	2	
12. b. iii.	The magnetic field will be weaker	2	
12. c. i.	Step-down	1	
12. c. ii.	12 V	2	Accept '12'
12. c. iii.	14.4 W	2	Accept '14.4'
12. c. iv.	Heat losses in transformer / eddy currents	2	Any correct answer