

AREA SECONDARY ANNUAL EXAMINATIONS 2011

Directorate for Quality and Standards in Education

Educational Assessment Unit

FORM 4

PHYSICS

MARKING SCHEME

SECTION A		40 MARKS	
Question	Answer	Marks	Additional Guidelines
1 a)	Repulsion	1	
	Attraction	1	
	Attraction	1	
1 b)	Positive	1	
1 c) (i)	By rubbing it with a cloth.	2	1 mark for 'rubbing / friction'
1 c) (ii)	Electrons transferred from perpep to cloth.	2	

2 a)	0 kgm/s	1	
2 b)	90 kgm/s	2	Deduct 1 mark for missing or incorrect unit.
2 c)	1.8 m/s	2	Deduct 1 mark for missing or incorrect unit. Accept -ve sign in front of value
2 d)	Total momentum before collisions equals to total momentum after collision provided no external force acts on the system	1	
2 e)	Because he has a greater mass.	1	Accept 'acceleration and mass are inversely proportional'
2 f)	Yes	1	

3 a)	Rays drawn correctly.	2	1 mark for each ray including arrows. If both arrows are missing deduce 1 mark
3 b)	Correct position of F.	1	
3 c)	Projector	1	
3 d)	2 ± 0.1	1	
3 e)	Real or magnified	1	
3 f)	Image becomes larger.	1	Accept 'image becomes blurred'
3 g)	Image becomes virtual, / upright.	1	Accept 'image disappears'

4 a)	20 Hz – 20 000 Hz	1	
4 b)	By means of compressions and rarefactions of air particles.	1	Do not accept 'by air particles' only. Accept 'by vibrations of air particles'
4 c)	Longitudinal	1	
4 d) (i)	Number of waves per second.	1	
4 d) (ii)	34 000 Hz	1	
4 d) (iii)	0.01 m	1	
4 e) (i)	Echo	1	
4 e) (ii)	27.2 m	1	Accept '27.2'

5 a)	Deceleration = 9 m/s^2 or ($a = - 9 \text{ m/s}^2$)	2	Deduct 1 mark for missing or incorrect unit.
5 b)	-9000 N	1	Accept '9000N'
5 c)	42 m	2	Deduct 1 mark for missing or incorrect unit
5 d) (i)	Increase	1	
5 d) (ii)	Less deceleration because of greater mass.	2	Accept 'acceleration and mass are inversely proportional'

SECTION B**45 MARKS**

6 a) (i)	Correct wavelength marked	1	
6 a) (ii)	2 m	1	
6 a) (iii)	2 Hz	1	
6 a) (iv)	4 m/s	2	Deduct 1 mark for missing or incorrect unit
6 b) (i)	Correct drawing.	2	1 mark for keeping wavelength constant. 1 mark for correct shape of waves.
6 b) (ii)	Normal drawn correctly at 90° to the wall	1	
6 c) (i)	Correct drawing	2	1 mark for drawing correct shape 1 mark for keeping wavelength constant
6 c) (ii)	Diffraction	1	
6 d) (i)	Diagram drawn correctly	3	1 mark for bending wave towards normal in glass, 1 mark for bending wave away from normal in air, 1 mark for drawing Normal on the glass air boundary
6 d) (ii)	Refraction	1	

7 a) (i)	12 Ω	1	
7 a) (ii)	0.75 A	1	
7 a) (iii)	4.5 V	1	
7 b) (i)	3 Ω	1	
7 b) (ii)	3 A	1	
7 b) (iii)	1.5 A	1	
7 c) (i)	Rheostat	1	Accept 'variable resistor'
	Voltmeter	1	Do not accept 'voltage meter'
	Ammeter	1	Do not accept 'current meter'
7 c) (ii)	Appropriate graph	4	1 mark for correct labelling of axes 1 mark for graph title 1 mark for correct plotting of graph 1 mark for correct size of graph
7 c) (iii)	7.5 \pm 0.2 A	1	
7 c) (iv)	0.56 \pm 0.1 Ω	1	

8 a) (i)	Constant velocity / speed	1	
8 a) (ii)	Decelerates	1	Accept 'reduce speed'
8 b)	0	1	
8 c) (i)	T marked in rectangle area	1	
8 c) (ii)	B marked in triangle area	1	
8 d) (i)	12 m	2	Deduct 1 mark for missing or incorrect unit
8 d) (ii)	52 m	1	
8 d) (iii)	5 m/s ²	2	Deduct 1 mark for missing or incorrect unit
8 e) (i)	Braking	1	
8 e) (ii)	Thinking	1	
8 e) (iii)	Thinking & braking	1	
8 e) (iv)	Braking	1	
8 e) (v)	Thinking	1	