



Annual Examinations for Secondary Schools 2014

FORM 5

PHYSICS

MARKING SCHEME

SECTION A		70 MARKS	
Question	Answer	Mark	Additional Guidelines
1 a	Density is the mass per unit volume	2	if formula is given, 1 mark
1 b	any mass balance	1	do not accept 'scales'
1 c	160 g	1	
1 d	2 g/cm ³	2	1 mark for correct working 1 mark for correct unit
1 e	Measure volume of liquid at eye level	2	accept any other correct answer
1 f (i)	It sinks	1	
1 f (ii)	because it is denser than the liquid	1	

2 a	Tension	1	
2 b	Friction	1	
2 c	Vector quantities are those that have both magnitude and direction	2	accept 'size' instead of 'magnitude'
2 d	2 N	1	
2 e	To the right	1	accept 'in the direction of A'
2 f	4 m/s ²	2	1 mark for correct working 1 mark for correct unit
2 g (i)	constant speed	1	
2 g (ii)	decelerate	1	

3 a (i)	0.3 kg m/s	2	1 mark for correct working 1 mark for correct unit
3 a (ii)	0.4 kg m/s	1	1 mark for correct working
3 b	- 0.1 kg m/s	2	accept 0.1 kg m/s
3 c	equal to, external	2	1 mark each
3 d (i)	To the left	1	
3 d (ii)	- 0.33 m/s	2	accept 0.33 m/s only if answer to 3 (b) was 0.1 kg m/s

4 a	atmospheric pressure	2	give 1 mark for 'air pressure'
4 b	stays the same, same depth	1, 1	
4 c (i)	1000 Pa	1 1 1	1 mark for changing depth to m 1 mark for correct working 1 mark for correct unit
4 c (ii)	decreases	1	
4 d	more pressure, greater density	1, 1	

5 a	longitudinal, transverse, vacuum, smaller	4	1 mark each
5 b	340 m/s	3	1 mark for halving time or doubling distance 1 mark for correct working 1 mark for correct unit
5 c (i)	Ex: all electromagnetic waves travel at the speed of light	1	accept any common property
5 c (ii)	ultraviolet, infrared	2	

6 a (i)	isotopes are atoms with the same number of protons but a different number of neutrons	2	
6 a (ii)	time taken for the count rate to fall by half or time taken for half the radioactive atoms to decay	2	
6 b	10 min	3	
6 c (i)	alpha particles	1	
6 c (ii)	choose 2 from: radioactive rocks, cosmic rays, nuclear fall-out	2	

7 a	8 V	2	1 mark for correct working 1 mark for correct unit
7 b	4 V	1	
7 c	0.4 A	2	1 mark for correct working 1 mark for correct unit
7 d	1.6 A	1	
7 e	2.5 Ω	2	1 mark for correct working 1 mark for correct unit
7 f	24 W	2	1 mark for correct working 1 mark for correct unit

SECTION B			100 MARKS
Question	Answer	Mark	Additional Guidelines
8 a	Air Resistance	1	
8 b	500 N	2	1 mark for correct working 1 mark for correct unit
8 c (i)	20 m/s	2	1 mark for correct working 1 mark for correct unit
8 c (ii)	180 000J	2	1 mark for correct working 1 mark for correct unit
8 d	22.5 %	2	1 mark for correct working 1 mark for correct answer in %
8 e	created, destroyed, changed, chemical, heat	5	
8 f (i)	increases	1	
8 f (ii)	safety belts, crumple zones or air bag	2	
8 g (i)	1000 N	1	
8 g (ii)	Newton's Third Law	2	

9 a (i)	Thermometer	2	
9 a (ii)	3, 2, 1, 5, 4	4	
9 a (iii)	Same initial temperature of water in cans, Same amount of water in cans	2	accept any reasonable precaution
9 b (i)	Temperature on y-axis, Time on x-axis	2	
9 b (ii)	Shiny - upper line, Black - lower line	2	
9 b (iii)	Black objects are better emitters of heat	1	
9 c	Room temperature	2	
9 d (i)	Conduction	1	
9 d (ii)	Convection	1	
9 d (iii)	Radiation	1	
9 e	Insulators	2	

10 a (i)	Magnet, Solenoid	2	
10 a (ii)	Magnetic field lines are cut by the solenoid and a current is induced	1 2	
10 a (iii)	Galvanometer deflects to the right	2	deflects to opposite direction
10 a (iv)	Stronger magnet, move magnet faster, solenoid with more turns	2	choose any two
10 b (i)	primary, secondary	2	1 mark for each word
10 b (ii)	step-up	1	
10 b (iii)	Steel is a hard magnetic material and does not lose its magnetism	2	accept any similar answer
10 b (iv)	Number of turns in the primary coil Number of turns in the secondary coil Voltage in the primary coil Voltage in the secondary coil	4	
10 b (v)	600 V	2	1 mark for correct unit

11 a (i)	Angle of incidence	2	
11 a (ii)	ray bends towards normal in glass	3	
11 a (iii)	Speed decreases	2	
11 b (i)	2.5 cm	2	
11 b (ii)	Continue ray through F on the right Ray from top of O through centre of lens Image upside down arrow where rays meet	1 1 1	
11 b (iii)	Camera	2	
11 c	Real, Inverted, Diminished	3	1 mark each
11 d (i)	2 cm	1	
11 d (ii)	1 cm	1	
11 d (iii)	$\frac{1}{2}$ or 0.5	1	

12 a	centre of gravity	2	
12 b	0.50 m or 50 cm	2	
12 c	Graph: <ul style="list-style-type: none"> • has correct axes • is drawn over more than half the graph • correct title • is a straight line • passes through origin • correct labelling 	1 1 1 1 1 1	
12 d	directly proportional	2	
12 e	In equilibrium, total anticlockwise moment equals to total clockwise moment	2	
12 f	1.25 N	2	
12 g	an arrow from pivot pointing upwards	2	
12 h	4.25 N	2	

Please Note: When marking questions that involve calculations, apply the ‘**follow through**’ rule. This means that if a student gives a wrong value for part (a) of a question and then uses the value of (a) in the subsequent calculations, marks should be deducted for part (a) only. The subsequent parts should be given full marks if these are correct.