DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Curriculum Management and eLearning Department
Educational Assessment Unit

Track 3

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

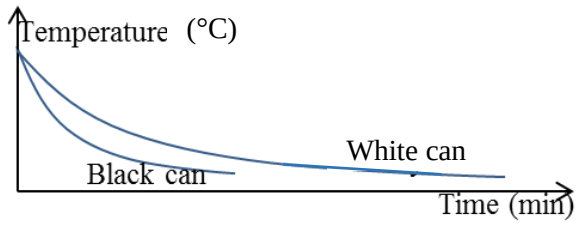
4 a	atmospheric pressure	2	give 1 mark for 'air pressure'
4 b	stays the same, same depth	1, 1	
4 c (i)	1000 Pa	1 1 1	1 mark for changing depth to m 1 mark for correct working 1 mark for correct unit
4 c (ii)	decreases	1	
4 d	more pressure, greater density	1, 1	

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	20 m/s	2	1 mark for correct working 1 mark for correct unit
8 b	600 000 J	2	1 mark for correct working 1 mark for correct unit
8 c	180 000 J	2	1 mark for correct working 1 mark for correct unit
8 d	created, destroyed, changed, chemical, heat	5	1 mark each
8 e	22.5 %	2	1 mark for correct working 1 mark for correct answer in %
8 f	choose 2 from: make car as light as possible, decrease friction between moving parts, make shape of car more aerodynamic, less drag or ai resistance	2	accept other reasonable answers
8 g (i)	choose 1 from: safety belts, crumple zones or air bag	1	
8 g (ii)	longer time to stop moving so less force	2	
8 h (i)	1000 N	1	
8 h (ii)	Newton's Third Law	1	

9 a (i)	Thermometer	1	
9 a (ii)	two cans having thermometers in them, well apart from each other	2	
9 a (iii)	• Heat the water in the kettle • Pour hot water in each can • Measure the temperature of water in each can and start the stopwatch • Measure the temperature every minute	1 1 1 1	
9 a (iv)	• Same initial temperature of water in cans • Same amount of water in cans	2	accept any reasonable precaution 1 mark for each precaution
9 b (i)		2	labels and units on each axis
(ii)		2	correct labelling of each curve
9 b (iii)	Black objects are better emitters of heat	1	
9 c	Temperature will be the same as that of the room because heat losses will then stop	2	
9 d (i)	Conduction	1	
9 d (ii)	Convection	1	
9 d (iii)	Radiation	1	
9 e	Insulators	1	

10 a	same density and thickness everywhere	2	
10 b	0.2 m	2	
10 c	5 ,8 ,10	3	1 mark each
10 d	Graph: • has correct axes • is drawn over more than half the graph • correct title • is a straight line • passes through origin	 1 1 1 1 1	
10 e	inversely proportional	2	
10 f	0.24 ± 0.02 N m	2	1 mark for correct working 1 mark for correct unit
10 g (i)	In equilibrium, total anticlockwise moment equals to total clockwise moment	2	
10 g (ii)	1.2 N	2	1 mark for correct working 1 mark for correct unit

11 a (i)	Angle of incidence	1	
11 a (ii)	• Ray bends towards normal in glass • Ray bends away from normal in air • Emergent ray is drawn parallel to incident ray	1 1 1	
11 a (iii)	Speed decreases	1	
11 a (iv)	Frequency remains the same	1	
11 a (v)	Total internal reflection	2	
11 b (i)	Principal focus	2	
11 b (ii)	Convex lens inside photographic camera	1	
11 b (iii)	• 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 (iv)	Real, Inverted, Diminished	3	1 mark each
11 b (v)	$^1/_2$ or 0.5	3	1 mark for correct measurements 1 mark for correct working 1 mark for correct answer

12 a (i)	The cutting of the magnetic field by the coil induces a current in the same coil	2	
12 a (ii)	Faraday's Law	1	
12 a (iii)	• Stronger magnet • Move magnet faster • Solenoid with more turns	2	choose any two
12 a (iv)	North pole	1	
12 a (v)	The pole is inverted and becomes a South pole	1	accept correct if the answer given is a pole opposite to that of (a)(iv)
12 a (vi)	Lenz's Law	1	

12 a (vii)	There is no deflection on the galvanometer since the lack of relative movement between the magnet and the coil does not generate an induced current	2	
12 b (i)	100 %	2	
12 b (ii)	primary, secondary	2	1 mark for each word
12 b (iii)	It strengthens/concentrates the magnetic field around the coils	2	
12 b (iv)	Steel is a hard magnetic material and does not lose its magnetism It will work against the transformer	2	
12 b (v)	360 V	2	1 mark for correct working 1 mark for correct answer

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.