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Secondary School
Kirkop
HALF-YEARLY EXAMINATION – February 2016
PHYSICS

MARKING SCHEME: FORM 3 (Track 3)

SECTION A

QUESTION	ANSWER	MARK	ADDITIONAL GUIDELINES
1 (a)	<div style="display: flex; justify-content: space-between;"> <div> <p><u>Quantity</u></p> <p>Force</p> <p>Length</p> <p>Pressure</p> <p>Mass</p> <p>Volume</p> </div> <div> <p><u>SI Unit</u></p> <p>m^3</p> <p>kg</p> <p>m</p> <p>N</p> <p>Pa</p> </div> </div>	5	1 mark for each correct answer.
(b) i.	length	1	Accept also 'spring balance'
ii.	Newton meter	1	
iii.	stopwatch	1	
2 (a)	8cm	1	
(b)	$16cm^3$	2	1 mark for answer and 1 mark for unit
(c) i.	11.2g	2	
ii.	Electronic balance	1	
iii.	Float. Its density is less than that of water.	2	
3 (a)	W is the <u>weight</u> of the book while R is the <u>reaction</u> force. W is the force exerted by the <u>book</u> on the <u>table</u> .	2	½ mark each.
(b)	$R = 5N$	1	
(c)	$m = W/g$ $m = 5/10 = 0.5kg$	2	1 mark for correct unit.
(d)	$W = mg$ $W = 0.1 \times 10 = 1N$	1	
(e)	Air Resistance upwards Weight downwards	2	1 mark each.
4 (a)	Force F	1	
(b)	180Nm	2	1 mark for working, 1 for unit
(c)	180Nm	1	use follow through

(d)	150N	2	1 mark for working, 1 for answer
(e)	360N - 150N = 210N	1	
(f)	Total upward forces = total downward forces	1	accept answer if written in short some way or another
5 (a)	W = mg W = 42 x 10 = 420 N	2	1 mark for correct unit.
(b) i.	A = 0.01 x 0.01 A = 0.0001 m ²	1	1 mark for correct unit. Accept 'force increases so pressure increases'
ii.	A = 0.0001 x 4 A = 0.0004 m ²	1	
iii.	P = F/A P = 420/0.0004 P = 1 050 000 Pa	2	
iv.	Pressure increases	1	
v.	Force increased so pressure increased as well since they are directly proportional.	1	

SECTION B

QUESTION	ANSWER	MARK	ADDITIONAL GUIDELINES
6 (a) i.	Honey	1	
	It is the liquid which sunk to the bottom.	1	
	2	1	
	Corn syrup	1	
	Nothing. There would be double the amount of rubbing alcohol at the top.	1	
(b)	0.92g/cm ³	2	
(c)	Olive oil (top), cooking oil, water (bottom).	1	
(d) i. ii. iii.	30cm ³	2	Accept any other relevant precaution.
	Read the bottom of the meniscus at eye level.	1	
	2.5g/cm ³	2	
	The same	1	
	The density of stone will not be different. The ratio of mass to volume will still be the same.	1	
7 (a) i. ii. iii.	Point B	1	
	Point A	1	
	Pressure is the same since they are at the same depth.	1	

iv.	$P = h \rho g$ $P = 2.3 \times 1029 \times 10$ $P = 23667 \text{ Pa}$	1 1	1 unit for correct working.
(b)i.	Correct scale and labelling of axes Correct title Correct plotting of points Correct drawing of graph – straight line	2 1 1 1	½ mark for scale; ½ mark for labelling of axes.
ii.	Pressure is proportional to depth.	1	
iii.	Atmospheric pressure	1	
iv.	When $P = 202 \text{ kPa}$, $d = 10\text{m}$	1	
v.	The bottom of the water dam needs to be thicker since pressure is greatest at the bottom. Pressure increases with depth.	1 1	Accept any relevant answer.
8 (a)	The force applied and the extension are directly proportional.	1	
(b)	electronic balance, spring	2	
(c)	correct diagram of Hooke's law setup (with a rubber band instead of a helical spring)	3	1 mark for correct diagram. 1 mark for correct labelling 1 mark if no missing apparatus
(d)	Load, extension	2	accept "Force" or "weight" instead of load. Accept "length of rubber band".
(e)	any two valid precautions	2	1 mark each
(f)	1cm	1	
(g)	$9\text{cm} + 3\text{cm} = 12\text{cm}$	1	accept 9cm
(h)	C, B, A	3	1 mark each