



**KULLEĠĠ SAN BENEDITTU**  
**Secondary School**  
**Kirkop**  
**HALF-YEARLY EXAMINATION – February 2016**  
**PHYSICS**

**MARKING SCHEME: FORM 3 (Track 3)**

**SECTION A**

QUESTION	ANSWER	MARK	ADDITIONAL GUIDELINES												
<b>1</b> (a)	<table style="width: 100%; border: none;"> <tr> <td style="text-align: center;"><u>Quantity</u></td> <td style="text-align: center;"><u>SI Unit</u></td> </tr> <tr> <td>Force</td> <td>m<sup>3</sup></td> </tr> <tr> <td>Length</td> <td>kg</td> </tr> <tr> <td>Pressure</td> <td>m</td> </tr> <tr> <td>Mass</td> <td>N</td> </tr> <tr> <td>Volume</td> <td>Pa</td> </tr> </table>	<u>Quantity</u>	<u>SI Unit</u>	Force	m <sup>3</sup>	Length	kg	Pressure	m	Mass	N	Volume	Pa	5	1 mark for each correct answer.
<u>Quantity</u>	<u>SI Unit</u>														
Force	m <sup>3</sup>														
Length	kg														
Pressure	m														
Mass	N														
Volume	Pa														
(b) i.	length	1	Accept also 'spring balance'												
ii.	Newton meter	1													
iii.	stopwatch	1													
<b>2</b> (a)	8cm	1													
(b)	16cm <sup>3</sup>	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													
<b>3</b> (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 x 10 = 1N	1													
(e)	Air Resistance upwards Weight downwards	2	1 mark each.												
<b>4</b> (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 <sup>2</sup>	1	1 mark for correct unit.  Accept 'force increases so pressure increases'
ii.	A = 0.0001 x 4 A = 0.0004 m <sup>2</sup>	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 It is the liquid which sunk to the bottom. 2 Corn syrup Nothing. There would be double the amount of rubbing alcohol at the top.	1 1 1 1 1	
(b)	0.92g/cm <sup>3</sup>	2	
(c)	Olive oil (top), cooking oil, water (bottom).	1	
(d) i.	30cm <sup>3</sup>	2	Accept any other relevant precaution.
ii.	Read the bottom of the meniscus at eye level.	1	
iii.	2.5g/cm <sup>3</sup> The same The density of stone will not be different. The ratio of mass to volume will still be the same.	2 1 1	
7 (a) i.	Point B	1	
ii.	Point A	1	
iii.	Pressure is the same since they are at the same depth.	1	

iv.	$P = h \rho g$ $P = 2.3 \times 10^29 \times 10$ $P = 23667 \text{ Pa}$	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.          Accept any relevant answer.
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	
<b>8</b> (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