



**FORM 3**

**PHYSICS**

**MARKING SCHEME**

SECTION A		70 MARKS	
Question	Answer	Mark	Additional Guidelines
1 a (i)	Any one of the following: crude oil, natural gas, coal, petrol, diesel, kerosene	1	accept other relevant answer
1 a (ii)	Readily available/ Concentrated sources of energy	1	
1 a (iii)	Because they eventually run out	1	can be used only once
1 b (i)	Any <b>one</b> of the following: not readily available, wind farms can be eyesores, danger to birds, noise produced by wind farms, high initial investment required	1	accept other relevant answer
1 b (ii)	Any <b>two</b> of the following: solar, wave, hydroelectric, biomass, geothermal, tidal	2	
1 c	45% efficient	2	accept '0.45'

2 a (i)	Mass remains the same	1	
2 a (ii)	Pressure decreases	1	
2 a (iii)	Density remains the same	1	
2 a (iv)	Speed decreases	1	
2 a (v)	Internal energy decreases	1	
2 b (i)	0.12 m <sup>3</sup>	1	accept '0.12'
2 b (ii)	0.132 kg	1	accept '0.132'
2 c	vacuum	1	

3 a (i)	tilt	1	
3 a (ii)	less	1	
3 b	planet, star, solar system, galaxy	1	
3 c	• mass on Mars = 900 kg	1	
	• weight on Earth = 9000 N	1	
	• weight on Mars = 3600 N	1	
3 d	Any <b>two</b> of the following: use of satellites, industry providing jobs, collaboration between countries, defend our planet from potential dangers, advances in everyday technology, colonisation of other planets	2	accept other relevant answers

4 a	conservation of energy	1	
4 b (i)	3.125 J	2	1 mark for unit
4 b (ii)	3.125 J	1	accept '3.125'
4 b (iii)	1.25 m	2	accept '1.25'
4 c	heat sound	1 1	

5 a (i)	<ul style="list-style-type: none"> <li>Friction</li> <li>Tension</li> </ul>	1 1	
5 a (ii)	Correct drawing of reaction.	1	
5 b (i)	metre rule	1	accept 'ruler'
5 b (ii)	Extension and load are directly proportional	1	graph is a straight line through origin accept any other relevant answers
5 b (iii)	70 cm	2	1 mark if answer given is 30cm
5 b (iv)	Correct straight line with less steep gradient	1	

SECTION B		100 MARKS	
Question	Answer	Mark	Additional Guidelines
6 a	The product of force and perpendicular distance from the pivot	1	
6 b (i)	Correct graph	5	1 mark for correct labelling of axes 1 mark for graph title 2 marks for correct plotting of graph 1 mark for correct size of graph
6 b (ii)	Circle around point (30, 6.8)	1	
6 b (iii)	7.5 N	1	accept other relevant answer
6 b (iv)	1000 N cm	1	accept '10 N m'. Do not award marks if unit is missing
6 b (v)	1000 N cm, it is in equilibrium	1, 1	
6 c (i)	288 N m	1	accept '288'
6 c (ii)	288 N m	1	accept '288'
6 c (iii)	0.48 m	2	accept '0.48'

7 a	The one made of plastic floats as its density is less than that of water Steel is denser than water and so the one made of steel sinks	1 1	
7 b	<ul style="list-style-type: none"> <li>He needs to find the mass of the beaker first when empty and then when filled with liquid</li> <li>The difference would be equal to the mass of the liquid</li> <li>The volume is noted on the measuring</li> </ul>	1 1	

	cylinder	1	
	<ul style="list-style-type: none"> <li>The formula density = mass/volume is used</li> </ul>	1	
7 c (i)	Greater Liquid pressure increases with depth	1 1	
7 c (ii)	Correct drawing	1	
7 d (i)	114 450 000 Pa	2	1 mark for unit
7 d (ii)	17 167 500 N	2	1 mark for unit
7 d (iii)	As it has to be roughly equal to atmospheric pressure, so that the pilot inside can be safe	1 1	

8 a (i)	Iron has a greater density than aluminium	1	accept 'they have a different density'
8 a (ii)	45 W	2	1 mark for unit
8 a (iii)	The iron block As it has a lower specific heat capacity than aluminium	1 1	
8 a (iv)	Conduction	1	
8 a (v)	Expansion	1	
8 b (i)	Correct drawing Correct labelling	2 1	
8 b (ii)	$c = Q/m\Delta\theta$	1	
8 b (iii)	<ul style="list-style-type: none"> <li>Heat energy is measured using joulemeter</li> <li>Mass of liquid is found using top pan balance</li> <li>Change in temperature is noted on thermometer</li> </ul>	1 1 1	
8 b (iv)	Any one of the following: Lagging to reduce heat losses/ Liquid is stirred to ensure a uniform temperature throughout the liquid/A lid is used to reduce heat losses/The highest temperature is taken	1	accept any other relevant precaution

**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.