Mark Scheme

Q1.

Question Number	Answer	Mark
	C 3 **C** is the only correct answer. **A** is incorrect because it does not include the pressure of the water above the diver. **B** is incorrect because it only includes the pressure of 10m of water above the diver. **D** is incorrect because it includes the pressure 0r 30m of water above the diver.	**(1)**

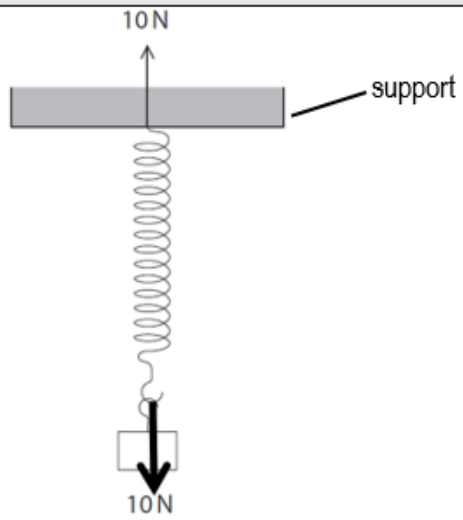
Q2.

Question Number:	Answer	Additional guidance	Mark
	use of 50/10 (1) 6 (times)(1)	5 seen in answer line addition of 1 atmosphere award full marks for the correct answer without working	**(2)** AO 2 2

Q3.

Question Number:	Answer	Additional guidance	Mark
	an explanation linking 2 from: pressure in a liquid increases with depth (1) the greater the height of water (in the container)(1) the more force (pushing water out) (1)	 allow greater {weight of / volume of/amount of /more} water greater force/pressure/push (on water)	**(2)** AO 2 1

Q4.

Question Number	Answer	Additional guidance	Mark
	 downwards arrow (1) Plus any one from: the same length as top arrow (1) from the bottom of the spring or from the weight (1)	 Anywhere below the support Judge by eye Judge by eye	**(2)**

Q5.

Question Number:	Answer	Mark
(i)	70 (kPa)	(2) AO 3 1a

Question Number:	Answer	Mark
(ii)	between 46 and 48 (kPa)	(1) AO 3 1a

Question Number:	Answer	Additional guidance	Mark
(iii)	any one from: the atmosphere gets less dense / thinner / has fewer molecules (as height above sea level increases) (1) or there is less air/oxygen (as the height above sea level increases)(1)	 accept particles less weight pushing down	(1) AO 1 1

Q6.

Question Number	Answer	Additional guidance	Mark
	(area) = 6.0 x 2.0 = 12 (1) substitution (1) (P=) $\frac{15\,000}{(12)}$ evaluation (1) 1300(Pa)	award one mark for 6.0 x 2.0 seen with no alternative area calculation Accept 15000/(any value) for this mark. accept 1250 (Pa) award full marks for the correct answer without working	(3)

Q7.

Question Number	Answer	Additional guidance	Mark
	substitution (1) (E=) ½ x 250 x 0.30(^{2}) evaluation 11 (1) unit (1) joule(s)/J	 accept 37.5, 37, 38 only accept 11.25, 11.2, 11.3 award full marks for the correct answer without working no POT error in evaluation independent mark j , Nm	**(3)**

Q8.

Question Number	Answer	Additional guidance	Mark
	An explanation to include the following MP1: (as the balloon rises) it gets bigger (1) Any **two** from: MP2: (because) density of air decreases / fewer (air) particles (in the atmosphere) (1) MP3: pressure (outside the balloon) decreases (1) MP4: pressure inside (balloon) is greater than pressure outside (1)	 accept balloon bursts air gets thinner accept a named component of air Two from MP2, MP3 and MP4 can still be awarded even if MP1 is not.	**(3)**

Q9.

Question Number	Answer	Additional guidance	Mark
(i)	substitution (1) 4.0=k x 0.06 rearrangement (1) $\frac{4.0}{0.06}$ (=k) evaluation (1) 67 (N/m)	allow substitution and rearrangement in either order (k=) $\frac{F}{x}$ allow values that round to 67 (N/m) award full marks for the correct answer without working POT error 2 marks maximum	**(3)**

Question Number	Answer	Additional guidance	Mark
(ii)	(measurement of) original length (1) (measurement of) final length (1)	Accept measure length of spring for 1 mark	(2)

Q10.

Question Number:	Answer	Mark
	Answers will be credited according to candidate's deployment of knowledge and understanding of the material in relation to the qualities and skills outlined in the generic mark scheme. The indicative (example) content below is not prescriptive and candidates are not required to include all the material which is indicated as relevant. Additional content included in the response must be scientific and relevant. • same force at tip and head of the thumb tack • flat end has a large surface area • pointed end has a very small surface area • using pressure =force /area • at pointed end the pressure is large • large pressure , tip goes into wood • at flat end the pressure is much less • the flat end does not damage the thumb	(1) AO 1 2

Level	Mark	Descriptor
	0	• No rewardable material.
Level 1	1-2	• Demonstrates elements of physics understanding, some of which is inaccurate. Understanding of scientific ideas lacks detail. (AO1) • Presents an explanation with some structure and coherence. (AO1)
Level 2	3-4	• Demonstrates physics understanding, which is mostly relevant but may include some inaccuracies. Understanding of scientific ideas is not fully detailed and/or developed. (AO1) • Presents an explanation that has a structure which is mostly clear, coherent and logical. (AO1)
Level 3	5-6	• Demonstrates accurate and relevant physics understanding throughout. Understanding of the scientific ideas is detailed and fully developed. (AO1) • Presents an explanation that has a well-developed structure which is clear, coherent and logical. (AO1)