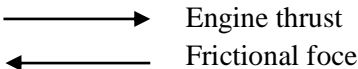
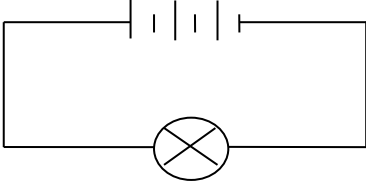


Modul Pintas Tingkatan 5
Peperiksaan Percubaan SPM 2018
Skema Jawapan Fizik
Kertas 2 4531/2

No 1	Mark Scheme	Sub Mark	Total Mark
(a)(i)	X- ray	1	1
(a)(ii)	Transverse wave	1	1
(b)(i)	Constant // same	1	1
(b)(ii)	Frequency of Gamma rays > radiowaves	1	1
			4

No	Mark Scheme	Sub Mark	Total Mark
2 (a)		1	1
(b)	same	1	1
(c)	0 N	1	1
(d)	$1200 = 270a$ $a = 4.44 \text{ m s}^{-2}$	1 1	2
			5

No 3	Mark Scheme	Sub Mark	Total Mark
(a)(i)	Ammeter	1	1
(a)(ii)	Potential difference// Voltage	1	1
(a)(iii)	9 V	1	1
(b)(i)	Direct current	1	1
(b)(ii)		2	2
		TOTAL	6

No	Mark Scheme	Sub Mark	Total Mark
4 (a)(i)	Net rate of heat flow between two object in thermal contact is zero	1	1
(a)(ii)	(i) Heat from metal block M is transferred to the water in the plastics cup (ii) Until rate of heat flow between them is equal// the metal block and water have the same temperature	1 1	2
(b)(i)	(i) $m_M c_M \Theta_M = m_w c_w \Theta_w$ $0.4 \times 850 \times (100 - x) \text{ (1)} = 0.15 \times 4200 \times (x - 25) \text{ (1)}$ $x = 51.3^\circ\text{C (1)}$	2 1	3
(b)(ii)	There is no heat lost to the surrounding	1	1
		TOTAL	7

5	(a)	INPUT		OUTPUT		2	2		
		A	B	C					
		0	0	1					
		0	1	1					
		1	0	1					
		1	1	0					
	(b)	INPUT			OUTPUT			3	3
		P	Q	R	S	T			
		0	0	1	1	0			
		0	1	1	1	0			
		1	0	1	1	0			
		1	1	0	0	1			
	(c)(i)	5.3(a) series 5.3(b) parallel					1	1	
	(c)(ii)	5.3(b)					1	1	
	(c)(iii)	AND gate					1	1	
							TOTAL	8	

No 6	Mark Scheme	Sub Mark	Total Mark
6 (a)	Image that cannot be formed on the screen	1	1
(b) (i)	Same	1	1
(ii)	$6.2 > 6.1$	1	1
(iii)	Same // Both has same virtual image	1	1
(iv)	$6.1 > 6.2$	1	1
(c)	As the object distance increases, the size of image decreases	1	1
(d)(i)	Smaller	1	1
(ii)	Focal length decreases	1	1
			8


No 7	Mark scheme	Sub Mark	Total Marks
(a)	Time taken of radioactive substances to reduce by half of its initial activity	1	1
(b)	1. 30 years 2. Draw a line from 50 activity on the graph	1 1	2
(c)	8055 – 55 8000 → 4000 → 2000 → 1000 Safe time = 1000 years	1 1 1	3
(d)(i)	Beta Medium penetrating power	1 1	2
(d)(ii)	Short Decays faster	1 1	2
		Total	10

No 8	Mark Scheme	Sub Mark	Total Mark
(a)	Pascal's Principle	1	1
(b)	$F = 25/1000 \times 1000$ $= 25 \text{ N}$	1 1	2
(c)(i)	Increases	1	1
(c)(ii)	Air is easily compressed	1	1
(d) (i)	Big To increase the output force	1 1	2
(d) (ii)	Big Can support bigger size of patient	1 1	2
(d)(iii)	Oil Incompressible liquid	1 1	2
(d)(iv)	Q	1	1
	TOTAL		12

9(a)(i)	Buoyant force = weight of water displaced		1	1												
(b) (i)	Mass is the same // constant Volume of water displaced in Diagram 9.1 > Diagram 9.2		1 1	2												
(b) (ii)	The lower the weight of water displaced, the higher the force The lower the buoyant force, the higher the force		1 1	2												
(b) (iii)	Archimedes' Principle		1	1												
(c)	1. Immersed the hydrometer in the car battery 2. Weight of hydrometer = Buoyant force 3. Less density, sink deeper 4. High density, float higher		1 1 1 1	4												
(d)	<table border="1" style="width: 100%;"> <thead> <tr> <th>Suggestion</th> <th>Reason</th> </tr> </thead> <tbody> <tr> <td>Low density basket</td> <td>Lighter</td> </tr> <tr> <td>More burner</td> <td>More hot air produce</td> </tr> <tr> <td>Balloon made from Nylon</td> <td>Strong material</td> </tr> <tr> <td>Soft basket</td> <td>Reduce impulsive force</td> </tr> <tr> <td>Morning day</td> <td>Different in density of balloon and surrounding</td> </tr> </tbody> </table>	Suggestion	Reason	Low density basket	Lighter	More burner	More hot air produce	Balloon made from Nylon	Strong material	Soft basket	Reduce impulsive force	Morning day	Different in density of balloon and surrounding		2 2 2 2 2 2	10
Suggestion	Reason															
Low density basket	Lighter															
More burner	More hot air produce															
Balloon made from Nylon	Strong material															
Soft basket	Reduce impulsive force															
Morning day	Different in density of balloon and surrounding															
Total			20													

No	Mark Scheme	Sub Mark	Total Mark
10 (a)	The change in speed of water waves when propagate through different depth of water	1	1
(b)	1. X is deeper than Y 2. X is bigger than Y 3. Speed at X is higher than Y	1 1 1	3
(c)	i. As the depth increases, the wavelength increases ii. The deeper the depth the higher the speed	1 1	2
(d)	1. At the centre of the ocean, the water waves travel at uniform speed as the depth of the sea is uniform. 2. When the waves reach the beach ,the water is shallower, wave speed reduced 3. Refraction causes the wavefront bend toward the normal 4. This results the wavefront following the shape of of coastline	1 1 1 1	4
(e) (i) (ii) (iii)	1. At bay 2. calmer// shallower 3. Buid a slanting barrier 4. reduce speed/energy of the waves 5. Concrete wall for the retainer / barrier 6. stronger 7. Build barrier with small opening 8. spread out the energy of the waves 9. Rough surface of barrier 10. reduce reflection 11. Higher height of barrier 12. water does not overflow 13 small size of wave 14. wave loses energy when hitting the wall 15. energy is reduced 16. due to smaller amplitude	1 1 Any 2 answers and correct reasons 1 1 1 1	10
		TOTAL	20

No 11	Mark Scheme	Sub Mark	Total Mark												
(a)	Spring constant. K is a ratio of force to the extension	1	1												
(b)	1. stiffness of the spring are different 2. diameter//thickness of the wire are different 3. diameter of the coil of wire is different 4. different extension even though the mass of the load is the same	1 1 1 1	5												
(c)	<table border="1"> <thead> <tr> <th>Modification</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Smaller diameter</td> <td>Enough space for the spring to be installed</td> </tr> <tr> <td>High elastics limit</td> <td>Can support motorcyclist up to 100 kg</td> </tr> <tr> <td>Higher spring constant</td> <td>Small compression of the spring</td> </tr> <tr> <td>Small natural frequency</td> <td>To reduce bumping</td> </tr> <tr> <td>Chosen : S</td> <td>Smaller diameter, high elastics limit, high spring constant and small natural frequency</td> </tr> </tbody> </table>	Modification	Explanation	Smaller diameter	Enough space for the spring to be installed	High elastics limit	Can support motorcyclist up to 100 kg	Higher spring constant	Small compression of the spring	Small natural frequency	To reduce bumping	Chosen : S	Smaller diameter, high elastics limit, high spring constant and small natural frequency	2 2 2 2 2	10
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Higher spring constant	Small compression of the spring														
Small natural frequency	To reduce bumping														
Chosen : S	Smaller diameter, high elastics limit, high spring constant and small natural frequency														
(d)(i)	$k = F/x$ $= 0.3 \times 10 / 0.06$ $= 50 \text{ N m}^{-1}$	1 1	2												
(d)(ii)	0.3 kg \longrightarrow 6 cm 0.5 kg \longrightarrow $6 \times 0.5 / 0.3$ = 10 cm Length of spring = 20 + 10 = 30 cm	1 1 1	2												
		TOTAL	20												

No 12	Mark Scheme	Sub Mark	Total Mark												
12 (a)	A region where magnetic force acting on it	1	1												
(b)(i)		1	1												
(b)(ii)	Density of magnetic lines increases	1	1												
(b) (iii)	1. Magnitude of current 2. Number of turns of solenoid	1 1	2												
(c)	<table border="1" data-bbox="357 757 1126 1397"> <thead> <tr> <th>Characteristics</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Number of turns of the coil high</td> <td>Increase the rate of cutting magnetic flux</td> </tr> <tr> <td>Low density of the coil</td> <td>The coil has the smaller mass</td> </tr> <tr> <td>High strength of magnet</td> <td>Produces a higher magnetic field strength</td> </tr> <tr> <td>Using 4 diodes</td> <td>Produce full-wave rectification</td> </tr> <tr> <td>Generator R is chosen</td> <td>has number of turns of the coil is high, low density, high strength of magnet and using 4 diodes</td> </tr> </tbody> </table>	Characteristics	Explanation	Number of turns of the coil high	Increase the rate of cutting magnetic flux	Low density of the coil	The coil has the smaller mass	High strength of magnet	Produces a higher magnetic field strength	Using 4 diodes	Produce full-wave rectification	Generator R is chosen	has number of turns of the coil is high, low density, high strength of magnet and using 4 diodes	2 2 2 2	10
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Generator R is chosen	has number of turns of the coil is high, low density, high strength of magnet and using 4 diodes														
(d) (i)	Copper	1	5												
(ii)	$I = 240/20$ $= 2A$	1													
(iii)	$P = 2^2 (20)$ $= 80W$	1													
		1													
			20												

