JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011 4531/1(PP)
PHYSICS
Kertas 1
Sept. 2011
PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 2 halaman bercetak

Question	Answer	Question	Answer
1	B	26	C
2	D	27	C
3	B	28	B
4	B	29	B
5	A	30	D
6	D	31	D
7	C	32	D
8	D	33	C
9	D	34	A
10	D	35	D
11	B	36	D
12	C	37	D
13	A	38	D
14	C	39	C
15	C	40	D
16	A	41	D
17	C	42	A
18	D	43	A
19	A	44	B
20	C	45	C
21	D	46	D
22	D	47	A
23	C	48	B
24	C	49	D
25	C	50	A

END OF MARKING SCHEME
PERATURAN PEMARKAHAN TAMAT

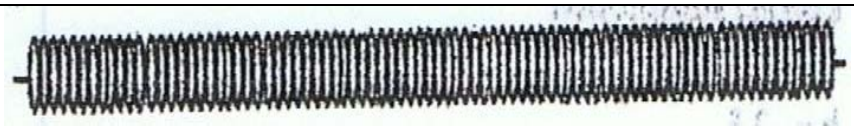
JABATAN PELAJARAN NEGERI TERENGGANU

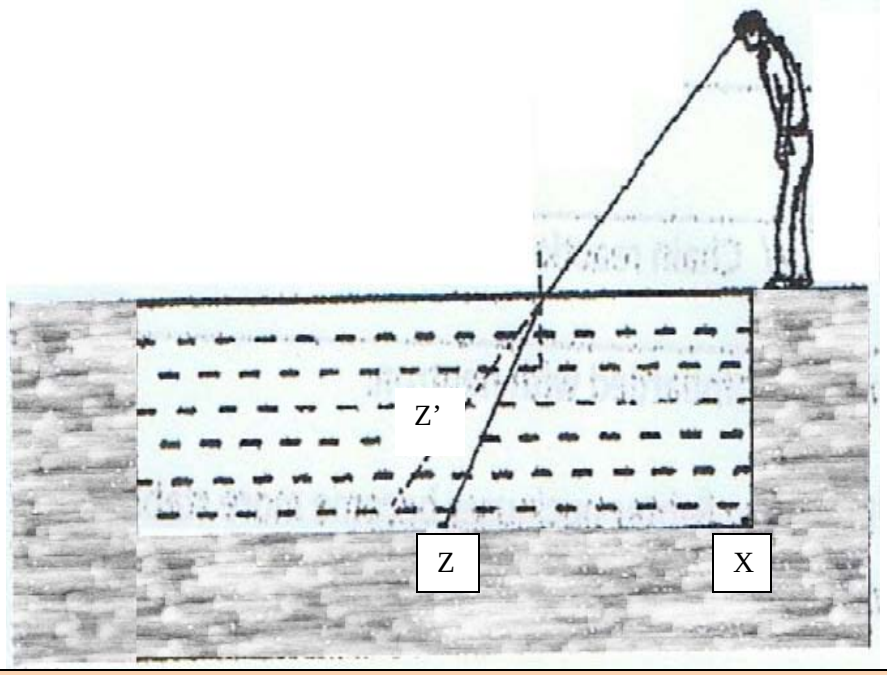
PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011 4531/2(PP)
PHYSICS
Kertas 2
Sept. 2011
PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 7 halaman bercetak

SECTION A [60 MARKS]

Question			Marking Criteria	Marks
1	(a)		No net heat transfer	1
	(b)		45°C	1
	(c)	(i)	Heat transfer from metal block to water	1
		(ii)	Increase the kinetic energy of the water molecule	1
			TOTAL	4
2	(a)		Transverse wave	1
	(b)		 0 amplitude	1 1
	(c)		$v = f\lambda$ $24 = f(6)$ $f = 4$ Hz	 1 1
			TOTAL	5
3	(a)		Nuclear fission // chain reaction	1
	(b)		Uranium bombarded with neutron Splits the two lighter nuclei to become more stable nucleus	1 1
	(c)		Mass deflected = 236.0529 – 235.8653 = 0.1876 a.m.u	1 1
	(d)		Energy is the mass deflect / lost of mass	1
			TOTAL	6
4	(a)	(i)	Refraction	1
		(ii)	Light ray travels from water (denser medium) to air (less dense medium) // vice versa Velocity of light ray increases // vice versa	1 1
	(b)	(i)	$1.33 = \frac{2.5}{h}$ $h = \frac{2.5}{1.33}$ $h = 1.88$ m	 1 1
		(ii)	1st: from observer bends to Z 2nd: straight line from observer to Z'	1 1

				
			TOTAL	7
5	(a)		Force per unit area	1
	(b)	(i)	Depth of water holes in Diagram 5.1 is shallower than in Diagram 5.2	1
		(ii)	The horizontal distance travelled by water jet in Diagram 5.1 is shorter than in Diagram 5.2	1
		(iii)	The further the horizontal distance travelled by water jet, the higher the pressure	1
		(iv)	The deeper the depth of water, the higher the water pressure	1
	(c)		Density of water	1
	(d)		The submarine submerges into deep water To withstand the high pressure due to deep water	1 1
			TOTAL	8
6	(a)		A temporary magnet only when current flows through the coils	1
	(b)	(i)	The number of dry cells in Diagram 6.1 is less than in Diagram 6.2	1
		(ii)	The magnitude of current in Diagram 6.1 is less than in Diagram 6.1	1
		(iii)	The number if pins attracted by the electromagnet in Diagram 6.1 is less than in Diagram 6.2	1
		(iv)	The strength of electromagnet in Diagram 6.1 is weaker than in Diagram 6.2	1
	(c)		The higher the current, the stronger the strength of electromagnet	1
	(d)		1st: draw the correct pattern 2nd: mark the correct direction	1 1
			TOTAL	8
7	(a)		Isotopes with unstable nucleus tend to decay	1
	(b)	(i)	Beta radiation / particle	1
		(ii)	Medium / moderate penetrating power	1

		(iii)	Geiger-Muller tube // GM Tube	1
	(c)	(i)	Because of background reading	1
		(ii)	Container R It shows the highest reading	1 1
		(iii)	420 count per second	1
	(d)		$80 \rightarrow 40 \rightarrow 20$ $2T_{\frac{1}{2}} = 30$ $T_{\frac{1}{2}} = 15$ s $(Answer\ with\ correct\ unit)$	 1 1
			TOTAL	10
8	(a)	(i)	Light Dependent Resistor // LDR	1
		(ii)	To complete the circuit of 240 V // To complete the secondary circuit	1
		(iii)	Increases	1
		(iv)	Base voltage increases There is a base current There is a collector current	1 1 1
	(b)		P is earphone To convert the alternating current to sound Q is capacitor Block a steady current (direct current) from flowing into the transistor and microphone R is microphone Change sound waves to alternating current	1 1 1 1 1 1
			TOTAL	12

SECTION B [20 MARKS]

Question			Marking Criteria	Marks
9	(a)	(i)	Product of mass and velocity // p = mv	1
		(ii)	▪ Total momentum in Diagram 9.1 is zero ▪ Magnitude of the momentum of the boy and the boat are equal ▪ Direction of the momentum of the boy and the boat are opposite ▪ Total momentum of the boy and the boat before and after the boy jumped are equal ▪ Total momentum before and after collision are equal	1 1 1 1 1
	(b)		▪ Liquid oxygen and liquid hydrogen fuel is burnt in the combustion ▪ The exhaust gas is ejected out of the rocket at high speed ▪ Large backward momentum is produced ▪ The rocket gained a large momentum forward	1 1 1 1

	(c)		**Suggestions** / **Explanations** Aerodynamic shape / To reduce air resistance Use low density material / It is lighter Use strong material / It does not break easily Use liquid oxygen / Boosting combustion Increase the size of the combustion chamber / More space for the furl to be burnt Has several stages that can be slip / strip off / To decrease the mass	1+1 1+1 1+1 1+1 1+1
			TOTAL	20
10	(a)		A narrow beam of fast-moving electrons in a vacuum	1
	(b)	(i)	Negative / (-)	1
		(ii)	▪ Voltage of EHT in Diagram 10.1 is lower than in Diagram 10.2 ▪ The of cathode ray in Diagram 10.2 deflects more than in Diagram 10.1	1 1
	(c)	(i)	When the voltage of EHT increases, the strength of electric field increases // directly proportional	1
		(ii)	When the strength of electric field increases, the deflection of cathode ray increases // directly proportional	1
	(d)		▪ The cathode is heated emits electrons ▪ The electron / cathode ray is accelerated ▪ Cathode rays travel in a straight line ▪ Cathode rays Is blocked by the maltase cross ▪ Cathode rays carry kinetic energy and converts to light energy when they hit the screen	1 1 1 1 1 [max 4]
	(e)		**Components** / **Functions** Filament / To heat up the cathode Cathode / Emit electrons Control grid / Control the number of electrons // control the brightness of the image on the screen Focusing anode / Focus the electrons into a beam Accelerating anode / To accelerate electrons towards the screen Y-plates / To deflect the electrons vertically X-plates / To deflect the electrons horizontally [Any 5 pairs]	1+1 1+1 1+1 1+1 1+1 1+1 1+1 [max 10]
			TOTAL	20

SECTION C [20 MARKS]

<table>
<tr><th colspan="3">Question</th><th>Marking Criteria</th><th>Marks</th></tr>
<tr><td>11</td><td>(a)</td><td></td><td>Aerofoil</td><td>1</td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td>▪ The shape of cross section of wing causes the speed of airflow above the wing is higher than the speed of airflow below the wing
▪ The higher the speed, the lower the pressure
▪ Hence the air pressure below the wing is higher than above</td><td>1

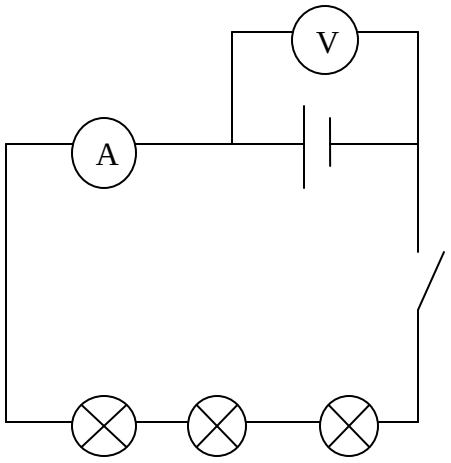
1
1</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>Bernoulli’s Principle</td><td>1</td></tr>
<tr><td></td><td>(c)</td><td></td><td><table><tr><th>Characteristics</th><th>Reasons</th></tr><tr><td>Shape of cross section of wing is aerofoil</td><td>To produce speed of airflow above the wing is higher than the speed of airflow below the wing</td></tr><tr><td>Large area of wing</td><td>To produce larger lift force</td></tr><tr><td>Density of the wing material is low</td><td>It is lighter // It can produce more upward force</td></tr><tr><td>High difference in speed of air</td><td>To produce higher difference in pressure</td></tr></table>
P is chosen because the shape is aerofoil, large area of wing, low density of wing material and high difference in speed of air.</td><td>1+1

1+1
1+1

1+1

1+1</td></tr>
<tr><td></td><td>(d)</td><td>(i)</td><td>$500 = \frac{F}{40}$
$F = 500 \times 40$
$= 20000$ N</td><td>

1
1</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>Resultant force $= 20000 - 800(10)$
$= 12000$ N
Direction of force: upwards</td><td>1
1
1</td></tr>
<tr><td></td><td></td><td></td><td>TOTAL</td><td>20</td></tr>
</table>

<table>
<tr><td>12</td><td>(a)</td><td></td><td>Potential difference // Voltage</td><td>1</td></tr>
<tr><td></td><td>(b)</td><td>(i)</td><td>▪ All symbols are correct
▪ Ammeter and bulb are in series
▪ Voltmeter is in parallel
▪ Correct parallel connection of bulbs</td><td>1
1
1
1</td></tr>
<tr><td></td><td></td><td>(ii)</td><td> 
</td><td></td></tr>
<tr><td></td><td>(c)</td><td></td><td><table><tr><th>Characteristics</th><th>Reasons</th></tr><tr><td>Thin diameter of wire</td><td>To produce high resistance</td></tr><tr><td>Use coil wire</td><td>Increase the resistance</td></tr><tr><td>Parallel arrangement of heating panels</td><td>If one panel not function, the other panel still function</td></tr><tr><td>High melting point</td><td>Can withstand high temperature</td></tr></table>
G is chosen because thin diameter of wire, use coil wire, parallel arrangement of heating panels and high melting point.</td><td>1+1
1+1
1+1
1+1
1+1</td></tr>
<tr><td></td><td>(d)</td><td>(i)</td><td>Electrical energy → Light energy</td><td>1</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>$40 = \mathrm{I}(240)$
$\mathrm{I} = \frac{40}{240}$
$= 0.167\ \mathrm{A}$

$\mathrm{E} = 40 \times 8 \times 20$
$= 6400\ \mathrm{Wh}$ or $6.4\ \mathrm{kWh}$</td><td>1
1
1
1</td></tr>
<tr><td></td><td></td><td></td><td>TOTAL</td><td>20</td></tr>
</table>

END OF MARKING SCHEME
PERATURAN PEMARKAHAN TAMAT

JABATAN PELAJARAN NEGERI TERENGGANU

PEPERIKSAAN PERCUBAAN
SIJIL PELAJARAN MALAYSIA 2011 4531/3(PP)
PHYSICS
Kertas 3
Sept. 2011
PERATURAN PEMARKAHAN

UNTUK KEGUNAAN PEMERIKSA SAHAJA

Peraturan pemarkahan ini mengandungi 6 halaman bercetak

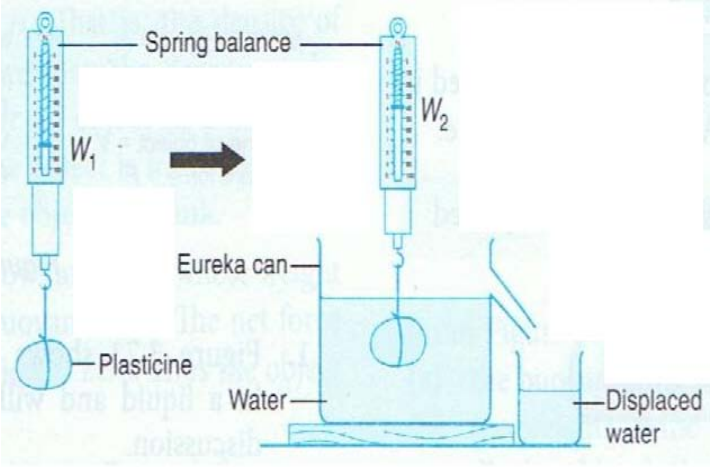
SECTION A [28 MARKS]

<table>
<tr><th colspan="3">Question</th><th>Marking Criteria</th><th>Marks</th></tr>
<tr><td>1</td><td>(a)</td><td>(i)</td><td>Refractive index // type of transparent material / n</td><td>1</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>Refracted angle / r</td><td>1</td></tr>
<tr><td></td><td></td><td>(iii)</td><td>Incident angle / i</td><td>1</td></tr>
<tr><td></td><td>(b)</td><td></td><td>
<table>
<tr><th>n</th><th>r / °</th><th>$\sin r$</th><th>$\frac{1}{\sin r}$</th></tr>
<tr><td>1.49</td><td>19.0</td><td>0.3256</td><td>3.07</td></tr>
<tr><td>1.92</td><td>16.5</td><td>0.2840</td><td>3.52</td></tr>
<tr><td>2.42</td><td>12.5</td><td>0.2164</td><td>4.62</td></tr>
<tr><td>2.91</td><td>10.6</td><td>0.1851</td><td>5.40</td></tr>
<tr><td>3.50</td><td>8.6</td><td>0.1492</td><td>6.70</td></tr>
</table>
▪ Columns of n, r, sin r, $\frac{1}{\sin r}$
▪ All the units of n, r, sin r, $\frac{1}{\sin r}$ are correct
▪ All the values of r $\pm 0.5°$
▪ Values of r constant at 1 decimal places
▪ Values of sin r constant at 4 decimal places
▪ Values of $\frac{1}{\sin r}$ constant at 2 decimal place
▪ All the values of r, sin r, $\frac{1}{\sin r}$ are correct
</td><td>1
1
1
1
1
1
1</td></tr>
<tr><td></td><td>(c)</td><td></td><td>▪ n at y-axis and $\frac{1}{\sin r}$ at x-axis
▪ The units at both axis are correct
▪ Both axis has a initial scale and not odd scale
▪ 5 points are plotted correctly
▪ 3 points are plotted correctly
▪ Smooth line
▪ The minimum size 5 × 4 from origin to the last point</td><td>1
1
1
1
1
1
1</td></tr>
<tr><td></td><td>(d)</td><td></td><td>Directly proportional</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>TOTAL</td><td>16</td></tr>
<tr><td>2</td><td>(a)</td><td>(i)</td><td>Directly proportional</td><td>1</td></tr>
<tr><td></td><td></td><td>(ii)</td><td>Straight line from 0.54 to the graph
$\frac{1}{a} = 2.7$
$a = 0.37$ m^2</td><td>1
1
1</td></tr>
<tr><td></td><td></td><td>(iii)</td><td>Draw a sufficient large triangle (minimum size 10 cm vertical)
Correct substitution (follow candidates' triangle)
$\frac{1.0 - 0}{4.9 - 0}$
= 0.20 m^2 (with / without unit)</td><td>1
1
1</td></tr>
</table>

	(b)		$f = \frac{700}{0.2}$ $= 3500 \text{ Hz s}^{-1}$	1 1
	(c)	(i)	Increases	1
		(ii)	From the formula, gradient is inversely proportional to frequency	1
	(d)		Repeat the experiment for a few times and take the average // The position of eye must perpendicular to the scale of reading of the metre rule	1
			TOTAL	12

SECTION B [12 MARKS]

Question			Marking Criteria	Marks
3	(a)		**State a suitable inference** Buoyant force depends on the volume of water displaced	1
	(b)		**State a relevant hypothesis** The larger the volume of water displaced, the larger the buoyant force	1
	(c)	(i)	**State the aim of the experiment** To investigate the relationship between the volume of water displaced and the buoyant force	1
		(ii)	**State the manipulated and responding variable** MV: Volume of water displaced RV: Buoyant force	1
			State a constant variable Density of water	1
		(iii)	**List out the important apparatus and materials** Ureka can, spring balance, 100 ml beaker, plasticine, thread	1
		(iv)	**Draw a functional diagram of the arrangement of apparatus**	1

<table>
<tr><td></td><td></td><td></td><td> 
</td><td></td></tr>
<tr><td></td><td></td><td>(v)</td><td>State the method of controlling the manipulated variable

Immerse the plasticine into the water and measure the immerse distance</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>State the method of controlling the responding variable

Measure the mass of the water collected from ureka can and find the weight using formula W = mg.</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>Repeat the experiment at least 5 times with different values

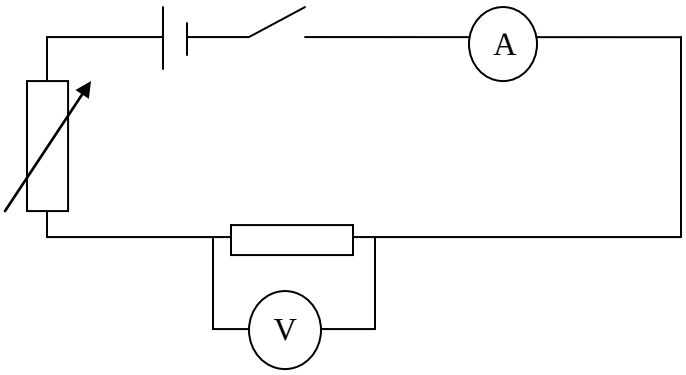
Repeat the different immerse distance</td><td>1</td></tr>
<tr><td></td><td></td><td>(vi)</td><td>Tabulation of data

<table>
<tr><th>V / cm^3</th><th>F / N</th></tr>
<tr><td>2.0</td><td></td></tr>
<tr><td>4.0</td><td></td></tr>
<tr><td>6.0</td><td></td></tr>
<tr><td>8.0</td><td></td></tr>
<tr><td>10.0</td><td></td></tr>
<tr><td>12.0</td><td></td></tr>
</table></td><td>1</td></tr>
<tr><td></td><td></td><td>(vii)</td><td>State how data will be analysed

A graph of buoyant force against volume of water displaced is plotted

F / N

V / cm^3</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>TOTAL</td><td>12</td></tr>
</table>

4	(a)		**State a suitable inference** Brightness of bulb depends on cell / battery voltage	1
	(b)		**State a relevant hypothesis** The larger the voltage / potential difference, the larger the current	1
	(c)	(i)	**State the aim of the experiment** To investigate the relationship between the voltage and current	1
		(ii)	**State the manipulated and responding variable** MV: Voltage / potential difference RV: Current	1
		(iii)	**State a constant variable** Resistance of conductor	1
		(iv)	**List out the important apparatus and materials** Voltmeter, ammeter, constantan wire, battery, rheostat	1
		(v)	**Draw a functional diagram of the arrangement of apparatus**  	1
		(vi)	**State the method of controlling the manipulated variable** Adjust the rheostat and record the initial reading of voltmeter such as 0.5 V	1
		(vii)	**State the method of controlling the responding variable** Read and record the reading of the ammeter	1
			Repeat the experiment at least 5 times with different values Repeat the experiment 5 times by adjusting the rheostat to get different potential difference / voltage / reading of ammeter	1

<table>
<tr><td></td><td></td><td></td><td>Tabulation of data

<table><tr><th>V / V</th><th>I / A</th></tr><tr><td>0.5</td><td></td></tr><tr><td>1.0</td><td></td></tr><tr><td>1.5</td><td></td></tr><tr><td>2.0</td><td></td></tr><tr><td>2.5</td><td></td></tr><tr><td>3.0</td><td></td></tr></table></td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>State how data will be analysed

A graph of current against potential difference / voltage is plotted

 
</td><td>1</td></tr>
<tr><td></td><td></td><td></td><td>TOTAL</td><td>12</td></tr>
</table>

END OF MARKING SCHEME
PERATURAN PEMARKAHAN TAMAT