SEKTOR SEKOLAH BERASRAMA PENUH
BAHAGIAN SEKOLAH
KEMENTERIAN PELAJARAN MALAYSIA

PEPERIKSAAN PERTENGAHAN TAHUN TINGATAN 5
SBP 2007

FIZIK

PERATURAN PERMARKAHAN

KERTAS 1

MARKING SCHEME – PAPER 1 (PHYSICS)

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

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TAHUN 2007

FIZIK

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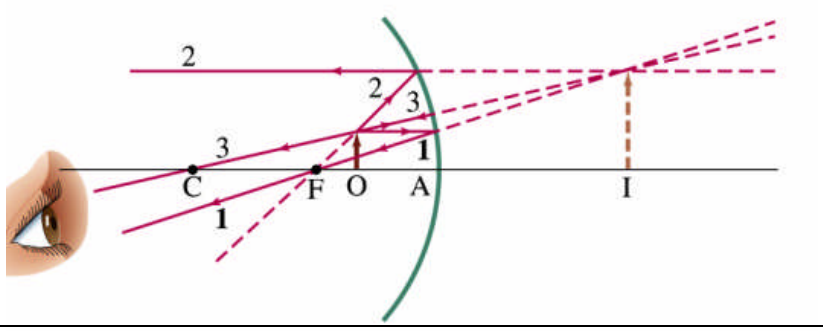
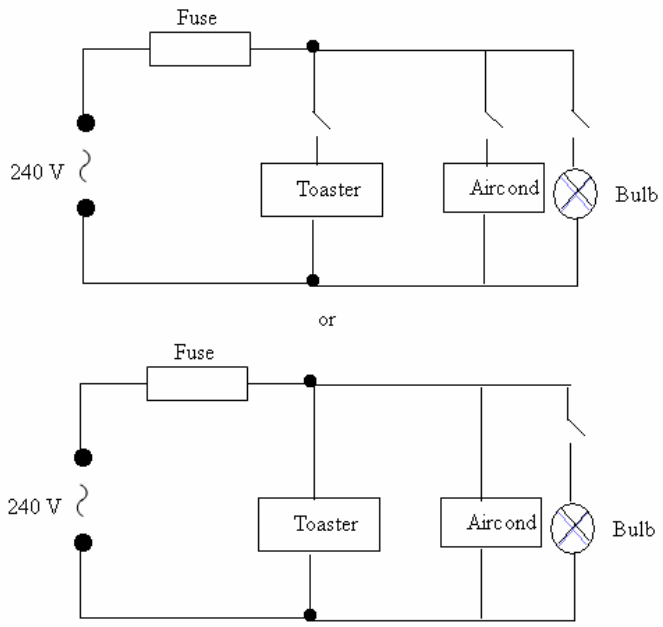
KERTAS 2

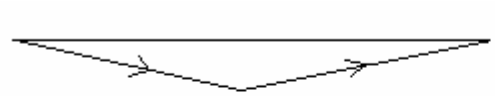
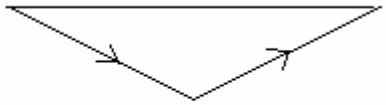
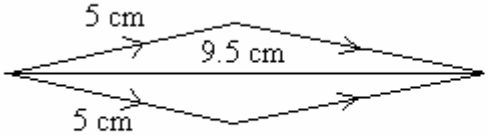
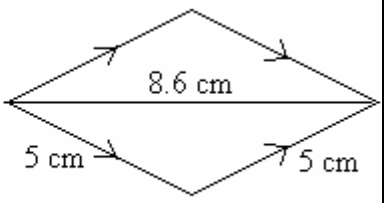
MARKING SCHEME PAPER 2 PHYSICS
MIDYEAR EXAM SBP 2007

1. (a) (i)	Ammeter	1
(ii)	Positive zero error// zero error	1
(b)	0.2 A	1
(c)	To avoid parallax error	1
	Total	**4**
2 (a)	$\frac{150x10^3}{3600}$ $= 41.67\ ms^{-1}$	1
(b)	$S = (\frac{v+u}{2})t$ $1.2 \times 10^3 = (\frac{41.67}{2})t$ $t = 57.60$ s or $1.2 = (\frac{0+150}{2})\ t$ $t = 0.016$ hour	1 1
(c)	Bigger Inertia // Bigger mass	1
	Total	**5**
3 (a)	Two objects in thermal equilibrium have the same temperature and there is no net flow of heat between them.	1
(b)(i)	Liquid x release heat to the surrounding Kinetic energy of molecules decrease	1 1
(b) (ii)	$35\ ^0C$	1
(c)	$Q = mc\theta$ $= (0.25)(4200)(90-35)$ $= 57\ 750$ J	1 1
	Total	**6**

4 (a)	Reflection of light	1
(b)	Concave mirror	1
(c)	Virtual, upright and magnified	1 1
(d)		1 1 1
	Total	**7**
5. (a) (i)	The mercury column in diagram 5.1 is higher than 5.2	1
(ii)	The higher the altitude the lower the vertical column of mercury	1
(b)(i)	The atmospheric pressure	1
(b)(ii)	The higher the atmospheric pressure the higher the height of the vertical column of mercury.	1
(c)	The vertical column of mercury becomes shorter The gas pressure push the column of mercury downward	1 1
(d)	Use very long tube Water has lower density	1 1
	Total	**8**
6 (a)	same frequency/same wavelength **and** constant phase difference/ same phase	1
(b)	1. Separations of consecutive nodal lines are constant for both Diagram 6.2 and Diagram 6.3 2. Separations of consecutive nodal lines for diagram 6.3 is smaller.	1 1
(c)	Wavelength for water waves in diagram 6.3 is smaller.	1
(d)	Distance between the two sources // a	1
(e)	Wavelength increases, separations of consecutive nodal lines increases//	1

	wavelength is directly proportional to separations of consecutive nodal lines	
(f)	1. Separations of consecutive nodal lines increases. 2. Wavelength increases when the depth of water increases.	1 1
	Total	**8**

7 (a)		2
(b)	Smaller resistance// when one of the appliances broke out, does not effect the others	1
(c)(i)	$I = \frac{80}{240}$ = 0.25 A $I = \frac{1500}{240}$ = 6.25 A $I = \frac{1200}{240}$ = 5 A Total I = 11.5 A	1 1 1
(ii)	13 A The value of Fuse should be greater than the magnitude of the electric current.	1 1
(d)	Cost = 1.5 x 3 x RM0.30 = RM 1.35	1 1
	Total	**10**

8. (a)	Two forces which act on the an object can be combined into a single force	1
(b)	 Diagram 8.1  Diagram 8.2	2
(c)(i)	 Diagram 8.1  Diagram 8.2 Resultant force = 9.5 x 1000 N = 9500 N Resultant force = 8.6 x 1000 N = 8600 N	1 1 1 1
(c)(ii)	Method in Diagram 8.1 Because resultant force is larger	1 1
(d)	F_R = 9500 – 500 = 9000 N F = ma a = F/m = $\frac{9000}{1000}$ = 9 ms^{-2}	1 1
(e)	The smaller the angle, the higher the resultant force // The larger the angle, the smaller the resultant force.	1
	Total	**12**

SECTION B

9. (a)	The product of mass and velocity	1
(b)	The shape of the ball A unchanged The shape of the ball B change The velocity of the ball A is higher than B The time of impact for ball A is shorter than B When the time impact is shorter, impulsive force is greater When the time impact is shorter, the velocity after collision is higher.	1 1 1 1 1
(c)	A soft ball has a high velocity A soft ball has a high momentum The soft ball player move his hand backward to increase time impact To reduce impulsive force	1 1 1 1
(d)	Front and rear crumple zones to increase time of impact //to reduce impulsive force. Air bags - will inflate during collision to prevent driver and passenger colliding with steering wheel and dashboard. Dashboard - made of soft material to lengthen the time of impact so as to reduce impulsive force. Seat belt to prevent passengers surging forward thus preventing them from hitting the interior of the car. Headrest to prevent backlash that can cause serious injuries to the neck when the car stop abruptly.	1 1 1 1 1 1 1 1 1 1
	Total	**20**

<table>
<tr><td>10. (a)(i)</td><td>transverse wave
A wave in which the particles of the medium oscillates the direction perpendicular to the direction in which the wave move

Longitudinal waves
A wave in which the particles of the medium oscillates the direction parallel to the direction in which the wave move</td><td>1

1</td></tr>
<tr><td>(a)(ii)</td><td><table>
<tr><td></td><td>Sound waves</td><td>Light waves</td></tr>
<tr><td rowspan="2">differences</td><td>Longitudinal waves</td><td>Transverse waves</td></tr>
<tr><td>Need a medium to propagate</td><td>Can travel through vacuum</td></tr>
<tr><td>similarities</td><td colspan="2">Can be refracted / reflected / diffracted / interference</td></tr>
</table>
Any two correct comparison. Accept other relevant answer.</td><td>

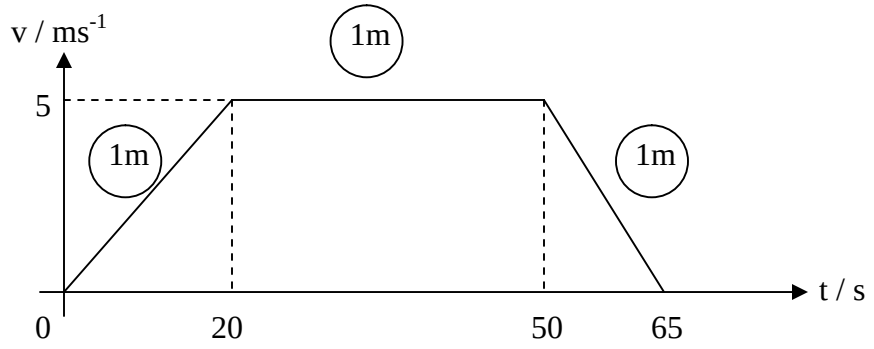
1
1</td></tr>
<tr><td>(b) (i)</td><td>carbon dioxide is denser than air / glass block is denser than air
the direction of the waves bend after passing through different medium
the speed of the waves change after passing through different medium

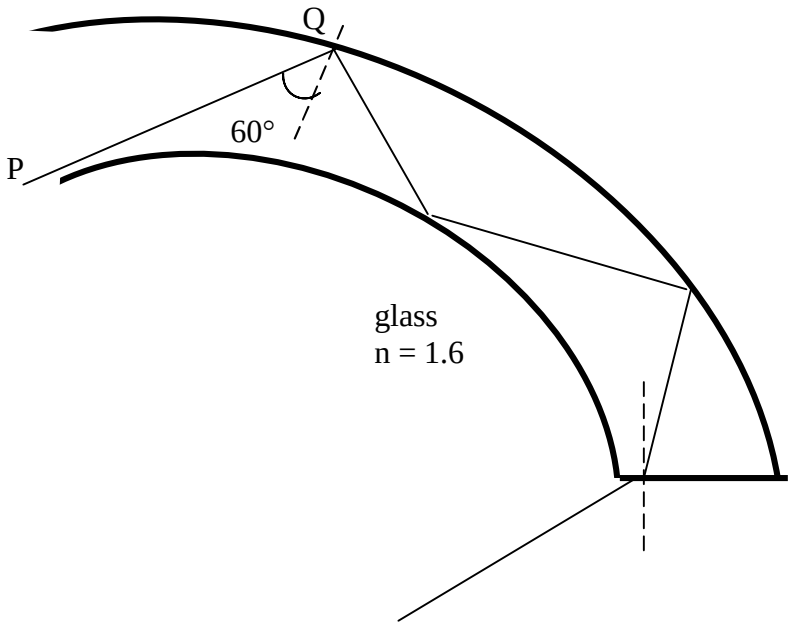
when the waves travel from less dense medium to denser medium;
- the direction of the wave propagation bent towards normal
- the speed of the wave decrease</td><td>
1
1
1

1
1</td></tr>
<tr><td>(b) (ii)</td><td>Refraction</td><td>1</td></tr>
<tr><td>(c)</td><td>The resort is to be built near the bay
At the bay a waves experience the divergence of the waves energy
At the cape a waves experience the convergence of the waves
The waves at the bay are calmer than the cape
To reduce erosion retaining walls are built
To reflect the waves from the shore
Reduce direct impact of the waves on the shore.
Concrete barrier structure with a gap in between are built at the designated area for children
Waves passing through the gap will be diffracted in the children’s area.
the smaller amplitude of the diffracted waves causes the sea to be calmer there</td><td>1
1
1
1
1
1
1
1

1
1</td></tr>
<tr><td></td><td>Total</td><td>20</td></tr>
</table>

SECTION C

11. (a)	the quantity of matter	1
(b) (i)	The mass must be high so that the vehicles becomes more stable the engine capacity must be high so the power is higher the types of engine is diesel so the cost is low the diameter of the tyre must be bigger so the pressure is low // more stable	1 1 1 1 1 1 1 1
(b) (ii)	the most suitable vehicle is P because it has high mass, high engine capacity, using diesel and bigger diameter of the tyre.	1 1
(c) (ii)	 y- axis (with correct value only) x – axis (with correct value only)	1 1 1 1 1
(c) (ii)	Distance = Area under the graph = ½ x 5 x 20 + 30 x 5 + ½ x 15 x 5 = 237.5 m	 1 1
(c) (iii)	a = gradient of the graph in the 1st part. = 5/ 20 = 0.25 ms-2	 1 1
	Total	20

12. (a)(i)	the angle of incidence which produces an angle of refraction of 90°.	1
(a)(ii)	the layer of air near the ground are hotter and less dense medium // the layer of air higher up are cooler and denser medium light from the sky in refracted towards normal after passing through less dense medium from denser medium. Near the ground, the angle of incidence is greater than the critical angle the total internal reflection occur and the light is reflected to the eye's observer.	1 1 1 1
(b) (i)	$n = \frac{1}{\sin c}$ $1.6 = \frac{1}{\sin c}$ c = 38.67°	 1 1
(b) (ii)	reflected from Q 2nd reflection inside the fibre optic the ray bend away from normal when it comes out from the fibre optic  	1 1 1

(c)	Small critical angle. Allow more light to involve in total internal reflection. strong material not easily broken. flexible material. Can easily change the shape. fine diameter. can enter small holes. S small critical angle, strong, flexible, fine diameter.	1 1 1 1 1 1 1 1 1 1
	Total	**20**

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KERTAS 3

Marking Scheme Paper 3 Physics Mid Year SBP 2007

Question	Marks	Marking Scheme
1 a (i)	1	**State the manipulated variable correctly** ; The distance object
(ii)	1	**State the responding variable correctly** ; The image distance
(iii)	1	**State one fixed variable;** The focal length
b		**Tabulate ,u, v, $\frac{1}{u}$ and $\frac{1}{v}$ correctly in the table.**
	1	**A** Shows a table which have *u, v,* $\frac{1}{u}$ and $\frac{1}{v}$
	1	**B** State the correct unit of u*/cm, v/cm,* $\frac{1}{u}$*/cm*$^{-1}$ and $\frac{1}{v}$/cm^{-1}
	1	**C** All values of v are correct
	1	**D** Values of $\frac{1}{u}$ are correct
	1	**E** Values of $\frac{1}{v}$ are correct
	1	**F** All values of are consistent
(c)		**Draw the graph of *W* against *h*.** A - Label y-axis and x-axis correctly

Object distance, u, (cm)	Image distance, v, (cm)	$\frac{1}{u}$, (cm^{-1})	$\frac{1}{v}$, (cm^{-1})
40	24.2	0.025	0.042
35	26.3	0.029	0.038
30	30.0	0.033	0.033
25	37.5	0.040	0.027
20	60.0	0.050	0.017

<table>
<tr><td></td><td></td><td>B - States the unit at the axis correctly
C - Both axes with the even and uniform scale:

D -5 points correctly plotted:

E - a smooth best straight line

F - minimum size of the graph is 5 x 4

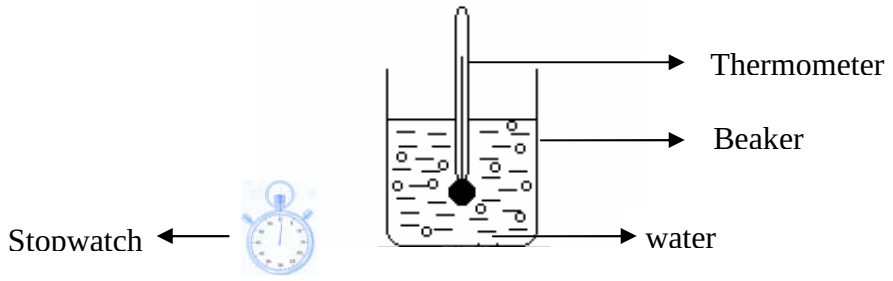
Squares of 2 x 2 cm:

<table><tr><th>Number of √</th><th>Score</th></tr><tr><td>6</td><td>5</td></tr><tr><td>5</td><td>4</td></tr><tr><td>3-4</td><td>3</td></tr><tr><td>2</td><td>2</td></tr><tr><td>1</td><td>1</td></tr></table></td></tr>
<tr><td>d</td><td>1</td><td>State the correct relationship based on the candidate's graph (negative gradient striaght line graph)
$\frac{1}{v}$ is directly propotional to $\frac{1}{u}$ with negative gradient</td></tr>
<tr><td>e</td><td>1</td><td>State ONE correct precaution so as to produce an accurate result of the experiment

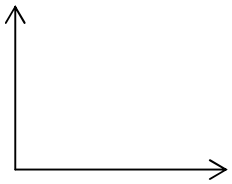
The position of the eye perpendicular when takes the reading to avoid errors due to parallax/systematic error</td></tr>
<tr><td>Total</td><td>16 Marks</td><td></td></tr>
<tr><td></td><td></td><td></td></tr>
</table>

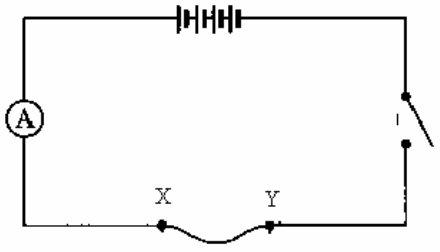
Question	Marks	Marking scheme	Note
2 a (i)	1	**State the relationship between x and $\frac{1}{a}$ correctly** **x** is directly propotional to $\frac{1}{a}$	
(ii)	1 1 1	$\frac{1}{a}$ = 0.25 **Show horizontal line parallel to the axis with the $\frac{1}{a}$ axis** x = 0.425 m	
(iii)	1	a = 2.22 m	
b (i)	 1 1 1	**Calculate the gradient of the graph and state the value within the acceptable range** Show the triangle with an acceptable size (4 x 4 squares of 2 cm) **Substitute correctly (according to the candidate's graph)** m = $\frac{2.25}{0.9}$ **State the correct value of the gradient with unit** = 2.5 m^2	
b (ii)	1 1 1	State $\lambda = \frac{Gradient}{D}$ **Substitute the gradient from b (i) correctly** = $\frac{2.5}{5}$ **State the correct answer with unit** λ = 0.5 m	
c	1	**State ONE correct precaution so as to produce an accurate result of the experiment** The experiment must be held on the field to avoid reflection of sound waves.	
Total	**12 marks**		

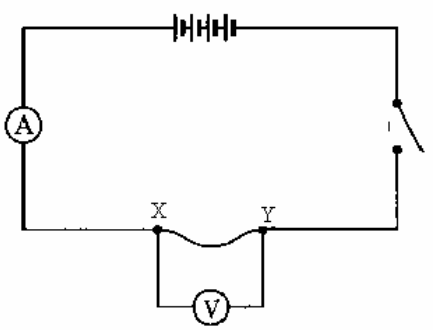
SECTION B

3 (a)	**1**	**State a suitable inference** The rate of cooling of an object depends on its masses.
(b)	**1**	**State a relevant hypothesis** The rate of cooling of water increases as its mass decreases.
(c)	**1**	**State the aim of experiment** To investigate the relationship between the rat e of cooling of water and its mass.
	1	**State the manipulated variable and the responding variable** **Manipulated :** mass of water // m **Responding :** Rate of cooling
	1	**State ONE variable that kept constant** Initial temperature / Final temperature
	1	**Complete list of apparatus and materials** Beaker 250 cm^3, measuring cylinder, water, electric heater.stopwatch, thermometer.
	1	**Arrangement of apparatus :** 
	1 **1** **1**	**State the method of controlling the manipulated variable** 1. Apparatus is set as shown in the above figure. 2. Water is heated to 55°C. 3. 50 cm^3 of water is placed in a 250 ml beaker with a thermometer immersed in the water. **State the method of measuring the responding variable** 4. The stopwatch is started when the temperature of the water is at 50°C. The stopwatch is stopped when the temperature reaches 35°C. The time, t is recorded.

<table>
<tr><td></td><td></td><td>Repeat the experiment at least 4 times
5. The experiment is repeated using volumes of water 100 cm^3, 150 cm^3, 200 $cm^3$and 250 cm^3.</td></tr>
<tr><td></td><td>1</td><td>Tabulation of data:
<table>
<tr><th>Mass, m (g)</th><th>Time, t (s)</th></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
<tr><td></td><td></td></tr>
</table></td></tr>
<tr><td></td><td>1

Total marks 12</td><td>Analyse the data .
Time, t (s)
 
Mass, m (g)</td></tr>
</table>

Question	mark	Marking Scheme
4 (a)	**1**	**State a suitable inference** An electric current//Resistance depend on the length of wire
(b)	**1**	**States a relevant hypothesis** When the length of wire increases, the electric current also decreases// resistance increase.
(c)		**Describe a relevant and workable experimental framework**
	1	**State the aim of experiment** To study the relationship between the electric current// resistance and the length of wire **State the manipulated variable and the responding variable**
	1	Manipulated variable : The length of wire Responding variable : The electric current//resistance
		State ONE variable that kept constant
		Fixed variable : The diameter of wire/E.m.f .
	1	**Complete list of apparatus and materials** Constantan wire, dry cells, ammeter and metre rule// Constantan wire, dry cells, ammeter, metre rule and voltmeter.
	1	**Note:** **A complete apparatus and materials means, with the apparatus and materials a set of data (manipulated and responding variables) can be obtained from the experiment**
		 **State the workable arrangement of the apparatus**

		or 
	1	**State the method of controlling the manipulated variable** 1. The apparatus is set up as shown in figure. 2. A length of constantan wire l = 20.0 cm is measured by using metre rule and is connected across terminal X and Y
	1	**State the method of measuring the responding variable** The switch is closed and the electric current, I is recorded by using ammeter.// and voltmeter then calculate R.
	1	**Repeat the experiment at least 4 times** The experiment is repeated with constantan wires of length l = 30.0 cm, 40.0 cm, 50.0 cm and 60.0 cm
		Tabulating of data
	1	The length of wire | The electric current, I | | | | | | | | | |
		or
Total		The length of wire | The electric current, I | The voltage, V | $R = \frac{V}{I}$ | | | | | | | | | | | | | | | | | | | |
	1	

	12 marks	**State how data will be analysed**