★

MODUL PINTAS TINGKATAN 5

Peperiksaan Percubaan Tahun 2019

Skema Jawapan Fizik

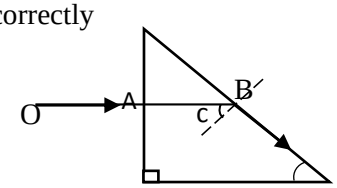
Kertas 2 4531/2

Jawapan Pintas Trial T5 P2

No 1	Scheme	Sub Mark	Total Mark
(a)(i)	acceleration	1	**1**
(a)(ii)	Displacement / distance	1	**1**
(b)	Constant/uniform acceleration // increasing velocity	1	**1**
(c)	7 s	1	**1**
	Total		**4**

No 2	Scheme	Sub Mark	Total Mark
(a)	Less dense Narrow tube	1 1	**2**
(b)	P = 76 +9 = 85 cm Hg = $\frac{85}{100}$ x 13600x10 = 115 600 Pa	1 1 1	**3**
	Total		**5**

No 3	Scheme	Sub Mark	Total Mark
(a)	**State the meaning of radioactivity** Spontaneous decay of unstable nucleus accompanied by the emission of radioactive rays	1	**1**
(b)	**State the method finding half-life** Show on the graph how the half-life is determined **State the half-life with unit** Half-life = 14 //15 days	1 1	**2**
(c)	**State the method to find the activity** 200 → 100 → 50 **State the activity** 28//30 days	1 1	**2**
(d)	**Complete the equation correctly** $^{32}_{16}P \rightarrow {}^{32}_{17}S + {}^{0}_{-1}e$	1	**1**
	Total		**6**

No 4	Scheme	Sub Mark	Total Mark
4(a)(i)	The ratio of sine of incident angle to sine of refracted angle	1	**1**
(ii)	Mark and label correctly 	1	**1**
(iii)	$\frac{1}{sin45^0}$ 1.4142	1 1	**2**
(iv)	Any value less than 45^0	1	**1**
(b)	Total Internal Reflection	1	**1**
(c)	They have different refractive index // optical density // critical angle	1	**1**
	Total		**7**

No 5	Scheme	Sub Mark	Total Mark
(a)	A region where a magnetic force acts on it	1	**1**
(b)(i)	The current in both diagrams are the same	1	**1**
(b)(ii)	The distance of wire PQ in diagram 5.3 is further	1	**1**
(b)(iii)	The magnetic field in diagram 5.3 is higher	1	**1**
(c)(i)	The higher the strength of magnetic field, the further the distance of wire PQ	1	**1**
(c)(ii)	The higher the strength of magnetic field, the greater the forced produced	1	**1**
(d)(i)	Vibrates // stationary	1	**1**
(d)(ii)	AC changes its direction alternately	1	**1**
	Total		**8**

No 6	Scheme	Sub Mark	Total Mark
(a)	(i) transverse (ii) perpendicular	1 1	**2**
(b)	(i) the size of the gap 6.1 larger than 6.2 (ii) the spreading of the waves after the gap6.1 less than 6.2 / 6.2 is more circular than 6.1 / diffraction 6.2 is more obvious than 6.1	1 1	**2**
(c)	(i) the larger the size of the gap, the lower the spreading of the waves after the gap / less circular the waves (ii) the more the spreading of the waves / more obvious the diffraction of waves, the smaller the amplitude of the waves ,	1 1	**2**
(d)	(i) diffraction (ii) the wavelength of light waves is too small // diffraction does not occur	1 1	**2**
	Total		**8**

No 7	Scheme	Sub Mark	Total Mark
(a)	Ratio of potential difference to current *Nisbah antara beza keupayaan dengan arus*	1	**1**
(b)(i)	Series (Diagram *7.1*) *Sesiri* (*Rajah 7.1*) $R = 2 + 2 + 2 = 6\ \Omega$ Parallel (Diagram 7.2) *Selari* (*Rajah* 7.2) $\frac{1}{R}=\frac{1}{2}+\frac{1}{2}+\frac{1}{2}$ $R=0.667\ \Omega$	1 1 1	**3**
(c) (i)	Bulbs in Diagram 7.2 are brighter *Mentol-mentol dalam Rajah* 7.2 *lebih cerah*	1	**1**
(c)(ii)	The effective resistance is low// more current flows *Rintangan berkesan rendah // lebih arus yang mengalir*	1	**1**
(d)(i)	–More number of dry cells *Lebih bilangan se lkering* –More current flows // more voltage *Lebih arus yang mengalir // lebih voltan*	1 1	**2**
(d)(ii)	-Series *Sesiri* - Produce higher EMF	1 1	**2**
	Total		**10**

No 8	Scheme	Sub Mark	Total Mark
(a)	Specific latent heat of vaporisation *Haba pendam tentu pengewapan*	1	**1**
(b)	1. Molecules become more closely packed/the bonds between the molecules is formed 2. Specific latent heat of fusion is released 3. Average kinetic energy of the molecules does not change *1. Molekul-molekul menyusun semula menjadi lebih rapat/ ikatan antara molekul terbentuk* *2. Haba pendam tentu pelakuran dibebaskan* *3. Purata tenaga kinetic molekul tidak berubah*	1 1 1	**Max: 2**
(c)(i)	– high *tinggi* - can absorb more heat from the food *Boleh menyerap lebih haba daripada makanan*	1 1	**2**
(c)(ii)	- low *rendah* - Can vaporise easily *Senang mengewap*	1 1	**2**
(c)(iii)	L	1	**1**
(d)(i)	$Pt = 750X3X60$ $= 1.35X10^5J$	1 1	**2**
(d)(ii)	$Q = mc\theta$ $1.35X10^5 = 2XcX40$ $c = 1687.5Jkg^{-1o}C^{-1}$	 1 1	**2**

<table>
<tr><td></td><td>Total</td><td></td><td>12</td></tr>
<tr><td>No 9</td><td>Scheme</td><td>Sub Mark</td><td>Total Mark</td></tr>
<tr><td>(a)</td><td>A push or a pull / quantity which change the motion of an object // change velocity / change of direction / size / shape
Reject : F = ma / rate of change of momentum</td><td>1</td><td>1</td></tr>
<tr><td>(b)(i)</td><td>1. Depth of sinking in Diagram 9.1 is more than in 9.2
2. The force applied in both diagrams is the same
3. The contact surface area in Diagram 9.1 is smaller than in Diagram 9.2
4. The bigger the surface area, the smaller the depth of sinking.
5. Pressure</td><td>1
1
1
1
1</td><td>5</td></tr>
<tr><td>(b)(ii)</td><td>1. When force is exerted on small piston , pressure is produced [P=F/A]
2. Pressure will be transmitted uniformly and equally in all parts of the enclosed liquid/oil
3. The same pressure exerted on bigger area
4. Large piston will produce bigger force [F=P x A]</td><td>1
1
1
1</td><td>4</td></tr>
<tr><td>(c)</td><td><table><tr><td>Aspect</td><td>Explanation</td></tr><tr><td>Big squeeze bulb</td><td>More air can be squeezed</td></tr><tr><td>Elastic squeeze bulb</td><td>Can return to its original shape easily</td></tr><tr><td>Narrow mid tube</td><td>Air flows at high speed</td></tr><tr><td>Narrow noozle</td><td>Higher pressure</td></tr><tr><td>plastic</td><td>lighter</td></tr></table></td><td>2
2
2
2
2</td><td>10</td></tr>
<tr><td></td><td>Total</td><td></td><td>20</td></tr>
</table>

No 10	**Scheme**	**Sub Mark**	**Total Mark**
(a)(i)	**State the potential difference across X and Z** 6V	1	**1**
(ii)	**State the total resistance across X and Z** 10kΩ + 20kΩ // 30 kΩ	1	**1**
(ii)	**Show the correct substitution** $I_{xz} = \frac{6}{30x10^3}$ **Answer with correct unit** 2×10^{-4} A	1 1	**2**
(iv)	**Show the correct substitution** $V_{BE} = \frac{10 \times 10^3}{30 \times 10^3}$ × 6 **State the potential difference across YZ** 2V	1 1	**2**
(v)	**Show the function correctly** To protect transistor (from high I)	1	**1**
(b)	**Give the explanation correctly**	1	

<table>
<tr><td></td><td>1. High resistance of LDR / R_x high / R_{LDR} high / R_{TU} high in dark
2. potential difference across YZ more / more V_{BE} / high V_{BE} / V_x high high V_B / high V_{LDR}
3. I_b / base current flow
4. higher Ic / collector current flows / transistor activated / current flows through LED / diode</td><td>1

1
1</td><td>Max : 3</td></tr>
<tr><td>(c)</td><td>
<table>
<tr><td>M1-State the electronic component at terminal XY
Thermistor at R_1 position</td><td>M2-State the reason for Ml
Thermistor is sensitive to heat // the resistance of thermistor decreases when the temperature increases // Its resistance varies with temperature</td></tr>
<tr><td>M3-State the electronic component at terminal YZ
resistor R_1 at LDR position</td><td>M4-State the reason for M3
Potential difference across R_1 is high when the room is hot / Resistance of R_1 is higher than thermistor // potential difference across thermistor is low</td></tr>
<tr><td>M5-State the electronic component at LED
Alarm</td><td>M6-State the reason for M5
to convert electrical energy to sound energy</td></tr>
<tr><td>M5-State the electronic component at LED
Relay at LED position</td><td>M6-State the reason for M5
Relay can switch on the alarm / to switch on the secondary circuit</td></tr>
<tr><td>Symbol - termistor</td><td></td></tr>
</table>
</td><td>2

2

2

2

2</td><td>10</td></tr>
<tr><td></td><td>TOTAL</td><td></td><td>20</td></tr>
</table>

<table>
<tr><th>No 11</th><th>Scheme</th><th>Sub Mark</th><th>Total Mark</th></tr>
<tr><td>(a)</td><td>Hooke's law</td><td>1</td><td>1</td></tr>
<tr><td>(b)</td><td>Explanation includes
• Thrust force of the train is used to compress spring
• Lengthen the time of impact
• reduce impulsive force,
• Kinetic energy of the train compresses spring and becomes elastic potential energy stored in the spring</td><td>
1
1
1
1</td><td>4</td></tr>
<tr><td>(c)</td><td>
<table>
<tr><th>Characteristic</th><th>Explanation</th></tr>
<tr><td>Small diameter [1]</td><td>Stiff spring //Large spring constant // Small length of compression// Harder to compress [1]</td></tr>
<tr><td>Thick spring wire [1]</td><td>Stiff spring //Large spring constant // Small length of compression// Harder to compress [1]</td></tr>
<tr><td>Rubber [1]</td><td>Longer time of impact // reduce impulsive force [1]</td></tr>
<tr><td>High density [1]</td><td>Withstand higher force // more compact [1]</td></tr>
</table>
Q is chosen
because small diameter, thicker spring wire, rubber and high density.</td><td>2
2
2
2
1
1</td><td>10</td></tr>
<tr><td>(d)</td><td>(i) F = m a
= (3.0 kg) (0.5 m s^{-2})
= 1.5 N
(ii) From the graph, spring constant, k = 20 N / 4 cm
k = 5 N cm^{-1}
The compression of the spring, x = F/k
= (1.5 N) / 5 N cm^{-1} = 0.3 cm

(iii) E_P = ½ Fx = ½ (1.5 N) (0.003 m)
= 0.00225 J</td><td>

1

1

1

1
1</td><td>5</td></tr>
<tr><td></td><td>Total</td><td></td><td>20</td></tr>
</table>

<table>
<tr><th>No 12</th><th>Scheme</th><th>Sub Mark</th><th>Total Mark</th></tr>
<tr><td>(a)(I)</td><td>Number of complete oscillations in one second.</td><td>1</td><td>1</td></tr>
<tr><td>(a)(ii)</td><td>• Frequency is inversely proportional to wavelength
• High pitch sound has high frequency and short wavelength
• Short wavelength sound is more difficult to be diffracted by the corner. Therefore, only student U can hear the sound clearly.
• Low pitch sound has long wavelength sound and it is easier to be diffracted by the corner. Therefore, all the students can hear the sound clearly.</td><td>1
1
1
1</td><td>4</td></tr>
<tr><td>(b)(i)</td><td>8 x 50 ms
400 ms</td><td>
1</td><td>1</td></tr>
<tr><td>(b)(ii)</td><td>1400 x $\frac{1}{2}$ x(b) (i) answer
280 m</td><td>1
1</td><td>2</td></tr>
<tr><td>(b)(iii)</td><td>$\frac{1400}{35000}$
0.04 m</td><td>1
1</td><td>2</td></tr>
<tr><td>(c)</td><td>
<table>
<tr><td>Characteristic</td><td>Reason</td></tr>
<tr><td>Concave</td><td>Reflected sound is converged to the auditorium</td></tr>
<tr><td>Soft board</td><td>Reduce reflection of sound</td></tr>
<tr><td>Large distance</td><td>The distance between two loud sound is small</td></tr>
<tr><td>High</td><td>Less reflection by obstacles</td></tr>
</table>
1,1
1,1
1,1
1,1
</td><td>10</td></tr>
<tr><td></td><td>Q
Because it has concave ceiling, uses soft board, large distance between speakers and high position for speaker</td><td>1
1</td><td></td></tr>
<tr><td></td><td>Total</td><td></td><td>20</td></tr>
</table>