



**MODUL PENINGKATAN PRESTASI TINGKATAN 5
TAHUN 2014
MAJLIS PENGETUA SEKOLAH MALAYSIA (KEDAH)**

MODUL 1

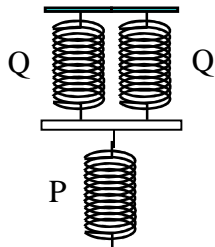
FIZIK

Kertas 2

Peraturan Pemarkahan

BAHAGIAN A

Soalan	Cadangan Jawapan	Markah
1(a)	5 s	1
(b)	-5 m	1
(c)	$\frac{8}{5}$ 1.6 m s^{-1}	1
		4
2(a) (i)	Zero error	1
(ii)	20.0 s	1
(b) (i)	1.0 s	1
(ii)	$\frac{4\pi^2 \times 0.25}{1^2}$ 9.87 m s^{-2}	1
		5
3(a)	Parallel	1
(b)	Complete circuit with 3 cells in series and 3 cells parallel	1+1
(c) (i)	$J = K = L$	1
(ii)	Same voltage // Same current	1
(d)	If one bulb blows, the other bulbs are not affected	1
		6
4(a) (i)	Two objects at thermal equilibrium have no net flow of heat between them	1
(ii)	40 °C	1
(iii)	Reduce heat loss to the surroundings	1
(b) (i)	Change in temperature of P (100 – 40) // Change in temperature of water (40 – 28) $0.4 \times c \times (100 - 40) = 0.2 \times 4200 \times (40 - 28)$ $c = 420 \text{ J kg}^{-1} \text{ }^\circ\text{C}^{-1}$	1 1 1
(ii)	No heat is lost to the surroundings	1
		7
5(a) (i)	Speed in liquid medium < speed in air	1
(ii)	Bends towards the normal	1
(iii)	When the speed decreases, the light ray bends towards the normal	1
(iv)	Refraction	1
(b) (i)	Light ray from P bending away from the normal to the eye Light ray entering the eye appear to come from Q	1 1
(ii)	$\frac{1.5}{1.1}$ 1.36	1 1
		8
6(a) (i)	spreads out // spreading	1
(ii)	Amplitude of the waves decrease Energy of the wave has spread out to cover a bigger area	1 1
(iii)	Diffraction	1
(iv)	No change	1
(b) (i)	Vibrates	1
(ii)	Remains stationary	1
(iii)	Reflection	1
		8

Soalan	Cadangan Jawapan	Markah
7(a)	A property of matter that enables an object to return to its original size and shape after the force acting on it is removed	1
(b) (i)	P : $\frac{40}{8}$ 5 N cm^{-1} Q : 20 N cm^{-1}	1 1 1
(ii)	The bigger the spring constant, the higher the stiffness of the spring	1
(iii)	✓ for 1 spring Q	1
(iv)		2
(v)	$\frac{1}{2} \times 100 \times 0.05$ 2.5 J	1 1
		10
8(a)	pascal // N m^{-2}	1
(b)	random momentum force area	1 1 1 1
(c)	Aerofoil	1
(d) (i)	< > < < <	1 1 1 1 1
(ii)	B	1
		12

BAHAGIAN B

Soalan	Cadangan Jawapan	Markah												
9(a) (i)	Total internal reflection	1												
(ii)	Objective lens: to produce a real, inverted and magnified image Eyepiece: to produce a virtual, upright and magnified image // a magnifying glass	1 1												
(iii)	can carry large amount of data/information // transmit signals with very little loss of energy // very much thinner and lighter // can be bent around corners	1 1												
(b) (i)	Object distance: Diagram 9.2 < 9.3	1												
(ii)	Image distance: Diagram 9.2 > 9.3	1												
(iii)	Image size: Diagram 9.2 > 9.3	1												
(iv)	The bigger the object distance, the smaller the image distance	1												
(v)	The bigger the image distance, the bigger the size of the image	1												
(c) (i)	Lens T is the objective lens Higher power / Shorter focal length // The object can be place close to the lens Lens R is the eyepiece Acts as a magnifying lens to produce a virtual and magnified image	1 1 1 1												
	Object between F and 2F To produce a real, inverted and magnified image	1 1												
	The image is between F and the optical centre of the eyepiece The eyepiece can further magnify the image formed by the objective lens	1 1												
(ii)	Bigger magnification	1												
(iii)	Connect a light bulb to shine light on the object	1												
		20												
10(a) (i)	Distance between two consecutive crests	1												
(ii)	Diagram 10.1: Wavelength is increasing Diagram 10.2: Wavelength decreases	1 1												
(iii)	Diagram 10.1: Speed is increasing Diagram 10.2: Speed decreases	1 1												
(iv)	The smaller the speed of the waves, the shorter the wavelength.	1												
(b) (i)	Switch at gate : electromagnetic waves Wireless bell : sound waves	1 1												
(ii)	Electromagnetic waves are transverse waves, Sound waves are longitudinal waves.	1 1												
(iii)	Diffraction // Reflection	1												
(c)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Aspect</th> <th>Suggestion</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Type of waves</td> <td>Microwaves</td> <td>Travel at the speed of light // Not easily dispersed</td> </tr> <tr> <td>Direction of transmission</td> <td>Transmit the waves in all directions</td> <td>Can detect aeroplanes coming from all directions</td> </tr> <tr> <td>Amplitude</td> <td>Bigger amplitude</td> <td>Waves reflected from the aeroplane will also have bigger amplitude and detected easily</td> </tr> </tbody> </table> <p>Measure the time interval between the transmitted wave and reflected wave Distance = d, time interval = t, speed of wave = v $2d = v \times t$ $d = \frac{d \times t}{2}$</p>	Aspect	Suggestion	Explanation	Type of waves	Microwaves	Travel at the speed of light // Not easily dispersed	Direction of transmission	Transmit the waves in all directions	Can detect aeroplanes coming from all directions	Amplitude	Bigger amplitude	Waves reflected from the aeroplane will also have bigger amplitude and detected easily	1+1 1+1 1+1 1 1
Aspect	Suggestion	Explanation												
Type of waves	Microwaves	Travel at the speed of light // Not easily dispersed												
Direction of transmission	Transmit the waves in all directions	Can detect aeroplanes coming from all directions												
Amplitude	Bigger amplitude	Waves reflected from the aeroplane will also have bigger amplitude and detected easily												
		20												

BAHAGIAN C

Soalan	Cadangan Jawapan	Markah															
11(a) (i)	The amount of heat to increase the temperature by 1 °C for a mass of 1 kg	1															
(ii)	Land has a smaller specific heat capacity than the sea Land is hotter than the sea Air above the land is hotter than the air above the sea Hot air above the land rises, pressure is lower Air moves from the region of higher pressure above the sea to the region of lower pressure above the land	1 1 1 1															
(b)	<table border="1"> <thead> <tr> <th>Aspect</th> <th>Suitability</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Surface of solar panel</td> <td>Dull black</td> <td>Good absorber of energy from sunlight</td> </tr> <tr> <td>Specific heat capacity</td> <td>Low</td> <td>Heats up quickly and releases heat quickly to the water</td> </tr> <tr> <td>Solar fluid pipe</td> <td>Copper</td> <td>Good conductor of heat</td> </tr> <tr> <td>Material for insulation</td> <td>Cotton</td> <td>Poor conductor of heat // Reduces heat loss from the hot water</td> </tr> </tbody> </table> <p>S is the most suitable solar panel with dull black surface, solar fluid with low specific heat capacity, solar fluid pipe made of copper, cotton in the insulation</p>	Aspect	Suitability	Explanation	Surface of solar panel	Dull black	Good absorber of energy from sunlight	Specific heat capacity	Low	Heats up quickly and releases heat quickly to the water	Solar fluid pipe	Copper	Good conductor of heat	Material for insulation	Cotton	Poor conductor of heat // Reduces heat loss from the hot water	1+1 1+1 1+1 1+1 1 1
Aspect	Suitability	Explanation															
Surface of solar panel	Dull black	Good absorber of energy from sunlight															
Specific heat capacity	Low	Heats up quickly and releases heat quickly to the water															
Solar fluid pipe	Copper	Good conductor of heat															
Material for insulation	Cotton	Poor conductor of heat // Reduces heat loss from the hot water															
(c) (i)	520 × 126 65 520 J	1 1															
(ii)	0.6 × 4200 × 25 63 000 J	1 1															
(iii)	2 520 J	1															
		20															
12(a) (i)	Direct current	1															
(ii)	Transformer Rectifier	1 1															
(iii)	Transformer – steps down the voltage Rectifier – converts alternating current to direct current	1 1															
(b)	<table border="1"> <thead> <tr> <th>Aspect</th> <th>Suitability</th> <th>Explanation</th> </tr> </thead> <tbody> <tr> <td>Length of heating element</td> <td>Long</td> <td>Air flowing through the heating element is heated for a longer time</td> </tr> <tr> <td>Specific heat capacity</td> <td>Low</td> <td>Heats up quickly</td> </tr> <tr> <td>Power of fan motor</td> <td>High</td> <td>Fan rotates faster // Higher volume of hot air blown out</td> </tr> <tr> <td>Number of fan blades</td> <td>More blades</td> <td>Higher volume of air blown out</td> </tr> </tbody> </table> <p>S is the most suitable long heating element, low specific heat capacity of wire of heating element, fan motor with high power, fan with more blades</p>	Aspect	Suitability	Explanation	Length of heating element	Long	Air flowing through the heating element is heated for a longer time	Specific heat capacity	Low	Heats up quickly	Power of fan motor	High	Fan rotates faster // Higher volume of hot air blown out	Number of fan blades	More blades	Higher volume of air blown out	1+1 1+1 1+1 1+1 1 1
Aspect	Suitability	Explanation															
Length of heating element	Long	Air flowing through the heating element is heated for a longer time															
Specific heat capacity	Low	Heats up quickly															
Power of fan motor	High	Fan rotates faster // Higher volume of hot air blown out															
Number of fan blades	More blades	Higher volume of air blown out															
(c) (i)	$\frac{1200}{240}$ 5 A	1 1															
(ii)	48 Ω	1															
(iii)	1200 × 4 × 60 288 000 J	1 1															
		20															