

**SULIT**  
**4531**  
**Physics**  
**August**  
**2011**

**4531**

**PEPERIKSAAN PERCUBAAN BERSAMA**  
**SIJIL PELAJARAN MALAYSIA 2011**

**ANJURAN**

**MAJLIS PENGETUA**  
**SEKOLAH MALAYSIA**  
**(MPSM)**  
**CAWANGAN PERLIS**

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**PHYSICS**

**PERATURAN PEMARKAHAN**

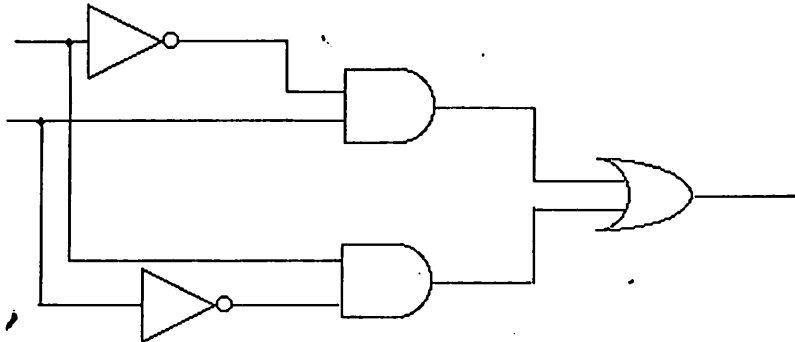
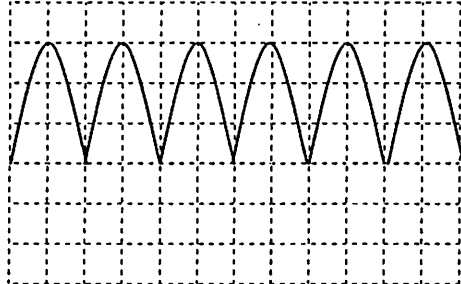
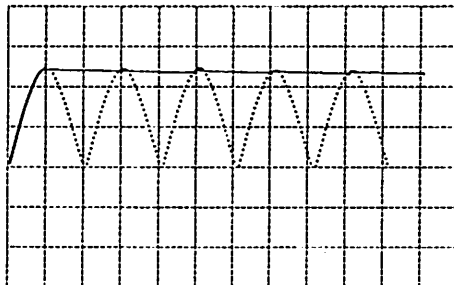
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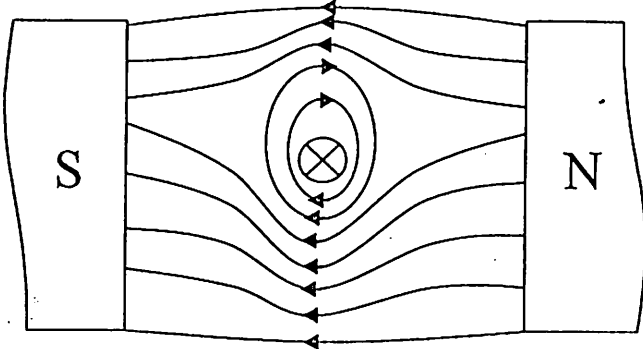
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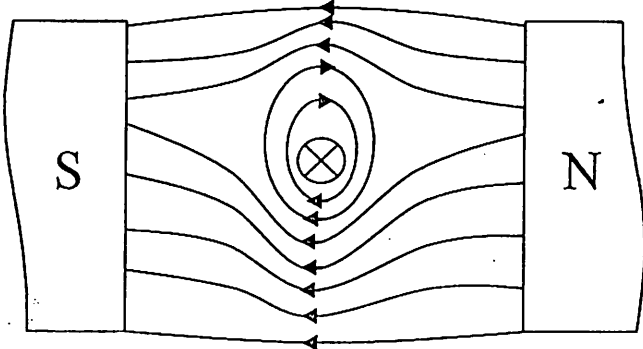
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Peraturan pemarkahan ini mengandungi 13 halaman bercetak

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
4(a)(i)	Speed of light is higher in air	1	7
(ii)	The light ray will bend more towards the normal	1	
(iii)	refraction	1	
(b)	$\frac{15}{11}$	1	
	1.36	1	
(c)(i)	Distance from the base of the beaker decrease	1	
(ii)	Apparent depth increase	1	
5 (a)	A condition in which there is no net heat flow between two objects that are in thermal contact with each other.	1	8
(b)(i)	Temperature of glass in diagram 5.2 is lower than temperature of glass in diagram 5.1.	1	
(ii)	Temperature of surrounding is higher than the temperature of glass.	1	
(c)(i)	Condensation of water vapour // condensation.	1	
(ii)	Temperature of the glass is lower than the temperature of surrounding. Water vapour outside the glass condensed at the surface of the glass.	1 1	
(d)	Heated the windscreen // turn on the air conditioner. The temperature of the windscreen higher than the temperature of water vapour inside the car // temperature inside the car lower than temperature outside the car/windscreen.	1 1	
6 (a)	Ohm's law states that the current flowing through an ohmic conductor is directly proportional to the potential difference across its ends provided that its temperature and the other physical conditions remain constant.	1	8
(b)(i)	Same	1	
(ii)	Z is brighter than Y	1	
(iii)	Same	1	
(c)(i)	P: Ammeter Q: Voltmeter	1 1	
(ii)	$R_T = \frac{10 \times 5}{10 + 5} + 5$	1	
	1.44 A	1	

NO	MARKING CRITERIA	MARK																										
		SUB	TOTAL																									
7(a)(i)																												
(ii)	<table border="1" data-bbox="296 723 1184 902"><thead><tr><th>A</th><th>B</th><th>X</th><th>Y</th><th>Z</th></tr></thead><tbody><tr><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr><tr><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td></tr><tr><td>1</td><td>0</td><td>0</td><td>1</td><td>1</td></tr><tr><td>1</td><td>1</td><td>0</td><td>0</td><td>0</td></tr></tbody></table>	A	B	X	Y	Z	0	0	0	0	0	0	1	1	0	1	1	0	0	1	1	1	1	0	0	0	2	
A	B	X	Y	Z																								
0	0	0	0	0																								
0	1	1	0	1																								
1	0	0	1	1																								
1	1	0	0	0																								
(b)(i)	Direct current	1																										
(ii)	To smooth the output	1																										
(iii)(a)		1																										
(b)		1																										
(iv)	The charging of the capacitor by the power supply and the discharging of the capacitor through the resistor will smooth the output	2	10																									

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
8(a)(i)	Move upwards	1	
(ii)	Fleming's Left-Hand Rule	1	
(iii)	 <p>Direction of magnetic field of permanent magnet from north to south Direction of magnetic field of straight wire, clockwise Correct pattern</p>	1 1 1	
(iv)	Use strong magnet/increasing the strength of the magnetic field // increasing the current.	1	
(b)(i)	Turning force / force increases Speed of the motor increases	1 1	
(ii)	Increasing the number of turns in the coil Increasing the strength of the permanent magnet	1 1	
(iii)	The coil not moving The current always change direction.	1 1	
			12

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(b)(i)	Turning force / force increases Speed of the motor increases	1 1	
(ii)	Increasing the number of turns in the coil Increasing the strength of the permanent magnet	1 1	
(iii)	The coil not moving The current always change direction.	1 1	
			12

## SECTION B

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
9(a)	Product of mass and velocity // momentum = mass x velocity	1	1
(b)	Total momentum = 0	1	5
	Total momentum before the bullet is fired = total momentum after the bullet is fired.	1	
	Magnitude of the momentum of the bullet and mortar are equal	1	
	Direction of the momentum of the bullet and mortar correctly are opposite.	1	
	Principle of Conservation of Momentum	1	
(c)	Figure 9.3	1	4
	The small tanks with distributed mass	1	
	will have smaller inertia	1	
	This greatly reduces the inertia impact if the tanker stops suddenly	1	
(d)	Type of brakes - using ABS	1	10
	Prevent wheel lock for safer braking.	1	
	The number of tyres - more tyres	1	
	Can withstand strong pressure because the base area is large	1	
	The size of the tanks - split the tanks becomes small compartment	1	
	Smaller inertia // reduces the inertial impact	1	
	The material for making the tanks – did not react with petroleum.	1	
	Avoid from licking // long lasting.	1	
	Distance between the trailer and the tractor - far / further	1	
	Ensure that the trailer will not collide with the tractor	1	
			20

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
10(a)(i)	Electric field is the region around an electric charge (or a charged object) in which other electric charges (or charged objects) are subjected to forces of either attraction or repulsion.	1	1
(ii)	▪ The shape of the flame is spread out in diagram 10.1(b)	1	5
	▪ The portion of flame of one side is bigger than the other side	1	
	▪ The air surrounding the flame is ionized with positive and negative ions in diagram 10.1(b)	1	
	▪ Negative ions are attracted towards positive plate P. Positive ions are attracted towards negative plate Q.	1	
	▪ The movement of the ions towards the plates P and Q caused the flame to spread out.	1	
(b)(i)	It indicates that it will use 36 joules of energy per second when it is connected to a 240 V power supply.	1	4
(ii)	Water heater.	1	
	Because it has the highest power rating.	1	
(iii)	By switching on the television only when it is necessary // do not let the television running without watching it // buys television with lower rating power.	1	10
(c)(i)	All connections must be connected in parallel from the main supply.	1	
	Each unit can be switched on and off separately.	1	
	The main fuse used is at least 30A.	1	
	Able to carry all the current for all of the appliances if switched on simultaneously.	1	
	or the main supply goes into a fuse box which has several lower rated fuses connected in parallel.		
	A 2 m copper rod is buried in the ground and is connected to the earth wire.	1	
	All electrical appliances (electric equipment) must be earthed for safety reasons in case of a leak or short circuit.	1	
	Air conditioners and water heaters are high power equipment. They must be connected to a separate wire passing through a separately fuse in the fuse box.	1	
	Connecting in parallel enable to be switched on and off separately.	1	
	All the lamps are connected in parallel.	1	
	Need to be switched on and off separately.	1	
			20

## SECTION C

NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
11	(a) Perpendicular force per unit area acting on a surface // force per unit area.	1	1
	(b)(i) $A \times h$	1	1
	(ii) $\rho \times A \times h // \rho Ah // \rho V$	1	1
	(iii) $\rho hAg // \rho Vg$	1	1
	(c) $P = \frac{\rho hAg}{A} // P = \rho hg$	1	3
	Unit : $\text{kg m}^{-3} \times \text{m}^2 \times \text{m s}^{-2}$	1	
	$\text{kg m}^{-1} \text{s}^{-2}$	1	
	(d) $\frac{3.0 \times 10^5}{1 \times 10^3 \times 10}$	1	3
	30 m (with unit)	2	
	(e) Size of the tyre is large	1	2
	Prevent backhoe from sinking into soft ground	1	
	Fluids used in hydraulic system is liquid	1	
	Not easy compress compared to the gases // high power	1	
	Large mass	1	
	Avoid backhoe from moving	1	
	Large base area	1	
	Ensure that the backhoe will not collide	1	
	Centre of gravity is low	1	
	More stable	1	
	The most suitable backhoe is M.	1	
	Large tyre, fluids use in hydraulic system is liquid, large mass, large base area and the centre of gravity is low.	1	
			20



NO	MARKING CRITERIA	MARK	
		SUB	TOTAL
12	(a)(i) The production of an electric current in a conductor moving in a magnetic field.	1	1
	(ii) Magnetic field cut by the moving solenoid. A current is induced in the conductor//solenoid.	1 1	2
	(iii) The strength of magnetic field // the number of turn on the solenoid // the speed of magnet.	1	1
	(b) <b>Number of turns of coil</b> - The number of turn in secondary coil less than the number of turn in primary coil - The mobile phone must use the low voltage for charging.	1 1	10
	<b>Types of the core</b> - Soft iron core - Easily magnetised and demagnetised	1 1	
	<b>Connection of terminal of secondary coil to mobile phone</b> - Connecting with diode - Mobile phone must charging using direct current.	1 1	
	<b>Shape of core</b> - Using single core // not separated. - More magnetic field will be cut by secondary coil.	1 1	
	<b>State most suitable choice of transformer and justification correctly</b> - Transformer Z - Number of turn in secondary coil less than primary coil, use soft iron core, connecting secondary coil to mobile phone with diode and using single core.	1 1	
	(c)(i) $\frac{12 \times 400}{240}$ 20	1 1	2
	(ii) $\frac{24}{12}$ 2 A (with correct unit)	1 1	2
	(iii) $\frac{24}{240}$ 0.1 A (with correct unit)	1 1	2
			20