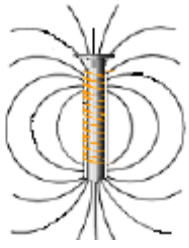
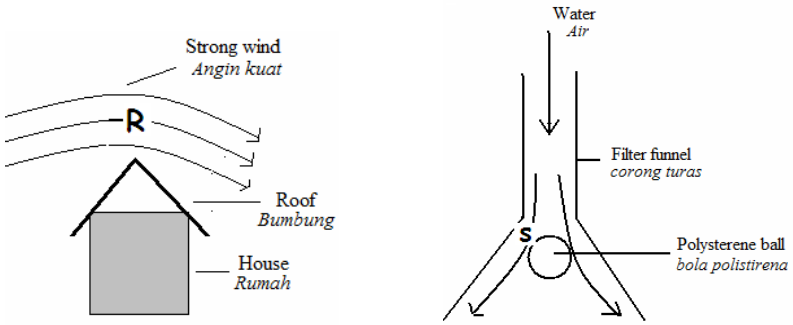
SKEMA TRIAL FIZIK SPM 2014
KERTAS 2

1. (a) Transverse wave
   (b) Reflection
   (c) Amplitude - reduce
Frequency- unchanged

2	(a) displacement per unit time / distance travelled in a unit of time in
	A specific direction
	(b) Inelastic collision
	(c) 8000 kg x 30 m/s + 1500 kg x (-20 m/s) = (8000 + 1500)kg x V
	V = 22.11 m/s
	(d) Momentum before collision equals momentum after collision
	(e) Safety belt / air bag / srumple zone

4. (a)	Net heat flow is zero / temperature is equal
(b)	The initial temperature of cloth is lower than the body temperature Heat energy is transferred until temperature is equal / no heat loss
(c)	Heat energy, Q = m c θ = 0.3 (4200) (38 – 30) = 10080 J (with unit)
(d)	Decrease

3 (a) (b) (i)	A temporary magnet when there is a flow of electric current 
	South / S
	Attracted to iron nail (electromagnet)
	- increase the number of turn/increase the current
	Magnetic lifting machine / circuit breaker / electric bell / electric relay / ticker timer / magnetic levitated train / electronic card

	/parking machine /tape recorder.	
5(a)	Bernoulli's Principle	
(b)	(i) (ii)	
	(iii)	The air move with a high speed at R it will produce a region with low pressure
(c)	use the flat roof which does not give rise to different velocity/ pressure whereas no upthrust. OR use much heavier roof which will be larger than the lifting force caused by strong wind.	

use the flat roof which does not give rise to different velocity/ pressure whereas no upthrust.

OR
use much heavier roof which will be larger than the lifting force caused by
strong wind.

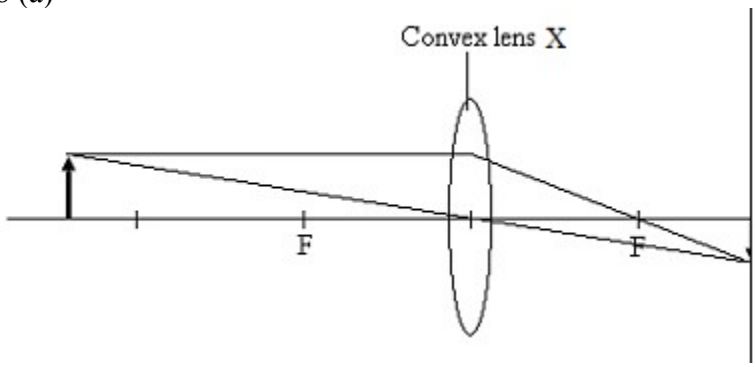
(i) Water levels are the same
(ii) Refer student diagram

6. (a)	X : Ammeter Y: Voltmeter
(b) (i)	Directly proportional
(ii)	Ohm's Law
(c) (i)	Resistance
(ii)	Constantan s.w.g 36
(iii)	Higher gradient

9 (a)	1	Energy caused by position from ground..
(b)(i)	1 1 1 1	The height of the ball at P > at Q Gravitational potential energy of the ball at P > at Q The velocity of the ball at Q > at P The Kinetic energy at Q > at P.

(ii)	1 1	The Kinetic energy increases as the gravitational potential energy decreases. Principle of conservation of energy.
(c)	1 1 1	Velocity increases Kinetic energy maximum / increases Based on the principle of conservation of energy, gravitational potential energy is zero because changed to maximum kinetic energy.
(d)	1 1 1 1 1 1 1 1 1 1	Semi circular curve shaped Exchange between kinetic energy and gravitational potential energy easily. Increasing / decreasing slope slightly Easily oscillates caused by changing of energy. Smooth surface Easily to moves // Reduce frictional force. Soft layer at the surface Reduce impulsive force when landing / accident. Strong material // concrete of foundation of the track. Withstand to the high force caused by jumping and landing.

8 (a)



(b) Real, diminished, inverted

(c)

(i) $1/f = 1/u + 1/v$

$v = 15$ cm

(ii) $m = v/u$ $m = 0.5$

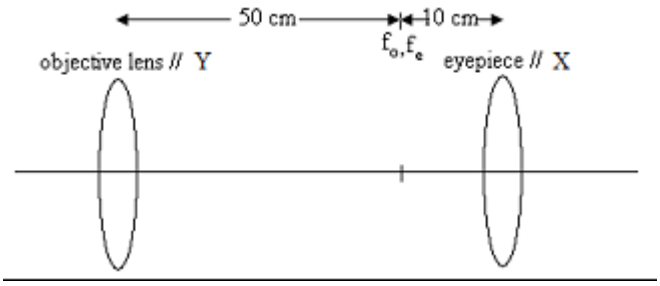
(d)

(i) Objective lens = convex lens Y

Eyepiece = convex lens X

(ii) Power of convex lens X > power of convex lens Y

(iii)



10. 10.

(a)

Aruhan elektromagnet adalah penghasilan daya gerak elektrik (d.g.e) aruhan dalam satu konduktor apabila terdapat perubahan fluks magnet kesan daripada gerakan relatif antara konduktor dan medan magnet.

Electromagnetic induction is the production of electromotive force (emf) induced in a conductor when there is a change in the magnetic flux by the effects of relative motion between the conductor and the magnetic field.

(b)(i)

Bilangan lilitan solenoid dalam Rajah 10.2 > Bilangan lilitan solenoid dalam Rajah 10.1
The number of turn of the solenoid in Diagram 10.2 > The number of turn of the solenoid in Diagram 10.1

Kekuatan medan magnet adalah sama.
The strength of magnetic field is same.

Pesongan jarum galvanometer dalam Rajah 10.2 > Pesongan jarum galvanometer dalam Rajah 10.1
Deflection pointer of galvanometer in Diagram 10.2 > Deflection pointer of galvanometer in Diagram 10.1

(b)(i)

(a)

(b)(ii)

(b)

Pesongan jarum galvanometer dalam Rajah 10.2 > Pesongan jarum galvanometer dalam Rajah 10.1
Deflection pointer of galvanometer in Diagram 10.2 > Deflection pointer of galvanometer in Diagram 10.1

Semakin banyak bilangan lilitan solenoid, semakin besar pesongan jarum galvanometer.
The higher the number of turns of the solenoid, the greater the deflection.

Semakin banyak bilangan lilitan solenoid, semakin besar arus aruhan dihasilkan.
The higher the number of turns of the solenoid, the greater the induced current is produced.

(b)(iii)
Hukum Faraday
Faraday's law

(c)
- Gegelung berputar dalam medan magnet.
  The coil rotates within the magnetic field.

- Fluks magnet terputus/ Berlaku perubahan medan magnet.
  Magnetic field lines cut/ The magnetic field changes.

- Arus aruhan mengalir dalam gegelung / D.g.e aruhan

Reka bentuk/ *Designs*	Sebab/ *Reasons*
Guna arus ulang-alik *Use alternating current*	Boleh dinaikkan dan diturunkan nilai voltan menggunakan transformer. *Able to increase and decrease the voltage using transformer*
Voltan tinggi *High voltage*	Supaya arus dalam kabel dikecilkan./ Menggurangkan kehilangan kuasa daripada pemanasan kabel *So that the current in the cable is smaller./ The loss of power due to heating of the wire is minimized.*
Transformer A ialah Transformer injak naik. *Transformer A is a step up transformer*	Menaikkan voltan merentasi kabel penghantaran. *To increase the voltage across the transmission cable.*
Transformer B ialah transformer injak turun. Transformer B is a step down transformer	Menurunkan voltan untuk banagunan kediaman. *To decrease the voltage for residential building.*
Bahan yang digunakan ialah kuprum/tembaga/ aluminium *The material used is copper/ aluminium*	Rintangan rendah/ Kuat *Low resistance/ strong*

Question 11

(a) (i) Quantity of heat needed to increase the temperature of a mass of 1 kg by 1°C or 1K

(ii)

Characteristics	Explanation
Low density	Easy to carry
High specific heat capacity	Ice will be melted slowly / Temperature of container would not increase easily.
High melting point	Will not melt in hot condition
Low thermal conductivity	Acts as heat insulator, less heat flows through the container

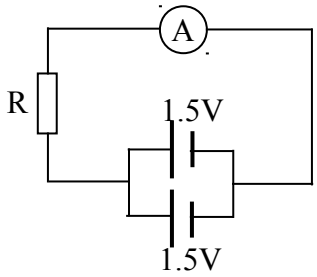
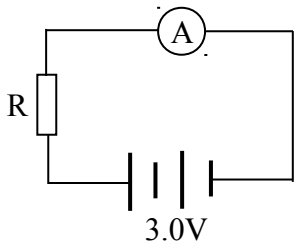
Choose D
because it has low density, high specific heat capacity, high melting point and low heat thermal conductivity.

(b)
- ✓ Quantity of heat supplied is the same.
- ✓ Increase of temperature, depends on Q (heat), m (mass) and c (specific heat capacity).
- ✓ For P and Q, c is constant but m is different, so rise in temperature is different.
- ✓ For P and R, m is constant but c is different, so rise in temperature is different

(c) (i)
- Heat is used to break the force of attraction between molecules.
- The total kinetic energy of the molecules remains constant.
- The temperature depends on the total kinetic energy, hence temperature will not change.

(ii) $Q = mc\Theta = 0.01 \text{ X } 2.1 \text{ X } 10^3 \text{ } (90 - 85)$
$= 105$ J

12	(*a*)	E.m.f as the work done by a source in driving a unit charge around a complete circuit // reading of the voltmeter across the battery when there is no current flow / open circuit.	1

	(b)	(i)   (ii) Parallel connection (iii) Diagram 12.1(b) provides higher voltage supply // higher total emf // higher current.	2 2 1 1
	(*c*)	<table><tr><th>Properties</th><th>explanation</th></tr><tr><td>Low power rating</td><td>Consume less electrical energy // save energy</td></tr><tr><td>Low cost</td><td>Save money // cheaper</td></tr><tr><td>High efficiency</td><td>Produce high power output // less energy wasted</td></tr><tr><td>Long lifetime</td><td>Last longer // use for longer period</td></tr></table>Lamp Q, It has lower power rating, low cost, high efficiency and long lifetime.	2 2 2 2 1 1

	(*d*)	(i) Electrical energy ⟶ light energy + heat energy	1
		(ii) $I = \frac{200}{240}$ Substitution – 1 mark $= 0.83A$ Answer with correct unit – 1 mark $R = \frac{V^2}{P}$ $= \frac{240^2}{200}$ $= 288\Omega$ Substitution – 1 mark Answer with correct unit – 1 mark	2 2