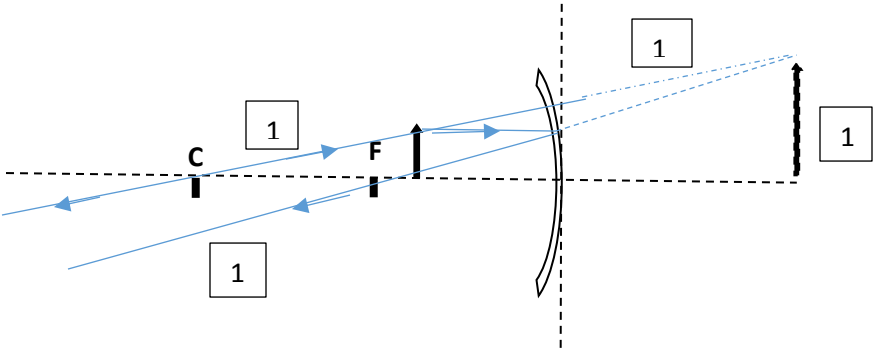
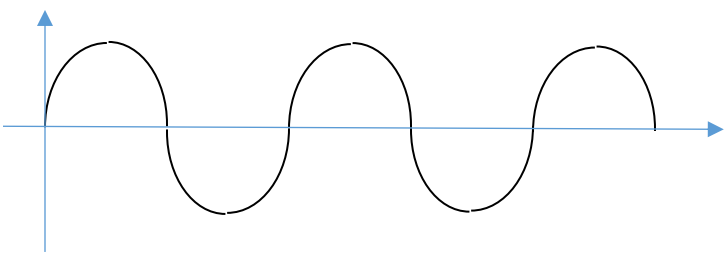


SKEMA JAWAPAN FIZIK KERTAS 2
PEPERIKSAAN PERCUBAAN SPM 2016
SMJK YU HUA KAJANG
Bahagian A

NO	MARKING CRITERIA	MARKS
	QUESTION 1	
1(a)	Positive zero error	1
(b)	zero error = + 0.03 mm actual reading = 11.67 – 0.03 = 11.64 mm	1 1
(c)	The glass will crack/break/compress	1
	TOTAL	4
	QUESTION 2	
2 (a)	Pascal principle	1
(b)	Pressure at point P is equal to pressure at point Q	1
(c)	$\frac{F_1}{A_1} = \frac{F_2}{A_2}$ $100 = \frac{F_2}{0.01 \times 0.2}$ $10\,000 = \frac{F_2}{0.2}$ $F_2 = 2\,000 \text{ N}$	1 1 1
	TOTAL	5

NO	MARKING CRITERIA	MARKS
QUESTION 3		
3(a)	Graphite	1
(b)	Water change to steam Rotate the turbine // Rotate the generator	1 1
(c)	$0.1958 \times 1.66 \times 10^{-27} / 3.25028 \times 10^{-28}$ $3.25028 \times 10^{-28} \times 3 \times 10^8$ 9.75084×10^{-20}	1 1 1
TOTAL		6
QUESTION 4		
4(a)	Can change shape, direction and speed of an object	1
(b)(i)	$\frac{1}{2} k x^2 = \frac{1}{2} (0.8) 0.12^2$ $= 0.0058 \text{ J}$	1 1
(b)(ii)	$\frac{1}{2} 0.06 v^2 = 0.0058$ $v = 0.44 \text{ ms}^{-1}$	1 1
(c)	<p>When external force act on the spring, forces of attraction and repulsion between molecules are not in equilibrium.</p> <p>When the external force is removed, the forces between molecules returned to equilibrium state/ forces of attraction = repulsion</p>	1 1
TOTAL		7

NO	MARKING CRITERIA	MARKS
QUESTION 5		
5 (a)	Heat absorb to change 1 kg of solid to liquid without any change of temperature	1
(b)	To determine the mass of water collected due to the melting of ice at room temperature	1
(c)	100 g	1
(d)	$L = Q/m = Pt/m$ - $50\,000 / 0.1$ $= 500\,000 \text{ Jkg}^{-1}$	1 1
(e)	Heat loss to the surrounding	1
(f)	The heater must be fully immerse in ice	1
TOTAL		7
QUESTION 6		
6 (a)	The bulb produces 20 J energy in 1 s if connected to 9V power supply	1
(b)	$P = VI \quad 20 = 9 I$ $I = 2.22 \text{ A}$	1 1
(c)(i)	As thickness increases, energy loss decreases // As thickness decreases, energy loss increases	1
(ii)	$P : 15/20 \times 100 = 75 \%$ $Q : 28/30 \times 100 = 93.33 \%$ $R : 43/50 \times 100 = 86 \%$	1 1 1
(iii)	Q	1
TOTAL		9

NO	MARKING CRITERIA	MARKS
QUESTION 7		
7(a)(i)	Image that can be formed on a screen	1
(ii)	increases	1
(b)		4
(c)(i)	At focal point To produce parallel light rays	1 1
(ii)	Between f and $2f$ To magnified image	1 1
TOTAL		10
QUESTION 8		
8 (a)	Slip rings	1
(b)	cutting of magnetic flux	1
(c)		2

(d)	Output current is an alternating current	1
(e)(i)	Thick // 2cm	1
	Increase the magnetic strength	1
(ii)	Curve	1
	To produce radial magnetic field	1
(iii)	More segment // 8	1
	Increase the cutting of magnetic flux	1
(f)	Q	1
	TOTAL	12

Bahagian B

NO	MARKING CRITERIA	MARKS												
	QUESTION 9													
(a)(i)	Rate of change of momentum.	1												
(ii)	1. Egg in diagram 9.2 break/ egg in diagram 9.1 does not break. 2. Force (act on the egg) on surface A is less than on surface B // vice versa. 3. Time of impact on surface A is less than on surface B//vice versa. 4. The egg breaks when the force is big because the time of impact on the egg is small. 5. The smaller the time if impact the bigger the force acting on the egg.	1 1 1 1 1												
(b)	1 Soft material/ thick material 2. reduce impulsive force act on the egg 3. increase the time of impact 4. the shorter the time impact, the higher the impulsive force	1 1 1 1												
(c)	<table border="1"> <thead> <tr> <th data-bbox="331 877 760 919">Modification</th> <th data-bbox="760 877 1219 919">Explanation</th> </tr> </thead> <tbody> <tr> <td data-bbox="331 919 760 1056">Shape of the shuttle – conical shape /oval /diagram</td> <td data-bbox="760 919 1219 1056">Allow for better / fast air flow//produce more lift force // reduce air resistance</td> </tr> <tr> <td data-bbox="331 1056 760 1203">Material used for shuttle – feather / small mass/ low density</td> <td data-bbox="760 1056 1219 1203">Light// high velocity/ acceleration //further distance travelled//reduce inertia // smaller mass</td> </tr> <tr> <td data-bbox="331 1203 760 1350">Material used for base of the shuttle – cork/ small mass/ low density</td> <td data-bbox="760 1203 1219 1350">Light// high velocity/ acceleration //further distance travelled//reduce inertia // smaller mass</td> </tr> <tr> <td data-bbox="331 1350 760 1476">Material used for the string of the racquet – strong/ low elasticity</td> <td data-bbox="760 1350 1219 1476">Not easily broken //withstand high force</td> </tr> <tr> <td data-bbox="331 1476 760 1640">High tension</td> <td data-bbox="760 1476 1219 1640">Short time impact// high impulsive force</td> </tr> </tbody> </table>	Modification	Explanation	Shape of the shuttle – conical shape /oval /diagram	Allow for better / fast air flow//produce more lift force // reduce air resistance	Material used for shuttle – feather / small mass/ low density	Light// high velocity/ acceleration //further distance travelled//reduce inertia // smaller mass	Material used for base of the shuttle – cork/ small mass/ low density	Light// high velocity/ acceleration //further distance travelled//reduce inertia // smaller mass	Material used for the string of the racquet – strong/ low elasticity	Not easily broken //withstand high force	High tension	Short time impact// high impulsive force	1 1 1 1 1 1 1
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	TOTAL	20												

QUESTION 10			
(a)	diffraction	1	
(b) (i)	wavelength 10.1 > 10.2	1	
	size of slit are same	1	
	circular wave for 9.1 or plane wave for 9.2	1	
(ii)	10.2 size of slit > wavelength, plane wave bending at the edge/slightly bend plane wave is produced // 10.1 size of slit < wavelength, circular wave is produced	1	
	The smaller the size of the slit compared to the wavelength, the diffraction effect more obvious.	1	
(c)	Radio wave is electromagnetic wave	1	
	Radio wave have higher velocity than sound wave	1	
	Radio wave can travel without medium but sound wave need the medium	1	
	has high frequency / carry more information	1	
	carry more energy/ can move further	1	
(d)	Modification	Reason	
	Frequency of signal is low	Longer wavelength/ diffraction easier	1
	The location of transmitter higher	no blocking / capture more signal	1
	the number of transmitter is more / many	increase the strength of signal/ increase energy of signal / reduce energy lost during transmission	1
	The strength of signal is higher	have more energy / can move further	1
	The distance between two transmitter is closer	increase the strength of signal/ increase energy of signal	1
			1
TOTAL		20	

Bahagian C

NO	MARKING CRITERIA	MARKS	
QUESTION 11			
(a)	Buoyant force equal to the weight of water displaced	1	
(b)	Rod A float because weight of rod equal to the buoyant force Buoyant force equal to weight of water displaced Rod A sink deeper in olive oil because olive oil less dense than water When the density decrease, volume of water displaced increase	1 1 1 1	
(c)(i)	$\rho = \frac{m}{V}, \quad V = \frac{m}{\rho}$ $= \frac{3}{800}$ $= 3.75 \times 10^{-3} \text{ m}^3$	1 1	
(ii)	$W_L + W_B = W_{\text{water displaced}}$ $W_L + 3 \times 10 = \rho_w V g$ $W_L + 30 = 37.5$ $W_L = 7.5 \text{ N}$ $m_L = \frac{7.5}{10} = 0.75 \text{ kg}$	1 1 1	
(d)	Characteristics	Reason	1 1 1 1 1 1 1 1
	Volume of the balloon is bigger	Produced bigger buoyant force / displaced more volume of air	
	Material used for balloon is nylon	Stronger / does not break easily	
	Material used for basket is rattan	Lighter / low mass / increase the time impact / reduce impulsive force	
	Temperature of air inside the balloon is higher	Reduce the density of air / reduce the mass of air in the balloon / increase upward resultant force / can carry more load	
	The best chosen is K because volume of the balloon is bigger, material used for balloon is nylon, material used for basket is rattan and temperature of air inside the balloon is higher		
	TOTAL		

QUESTION 12														
(a)	<p>the percentage of useful energy transformed compared to total energy input.</p> $\text{Efficiency} = \frac{\text{Power output}}{\text{Power input}} \times 100\%$	1												
(b)	<p>alternating current current can be step-up (its voltage) by using a transformer The voltage for long distance transmission should starts with higher value, in order to reduce the current in power line The power loss due to the resistance in power line can be reduce</p>	1 1 1												
(c)	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 50%;">Characteristics</th> <th style="width: 50%;">Reason</th> </tr> </thead> <tbody> <tr> <td>Np:Ns = 200:20 000</td> <td>to step-up voltage / output voltage increases</td> </tr> <tr> <td>soft iron core</td> <td>easily magnetized and demagnetized</td> </tr> <tr> <td>thinner</td> <td>to reduce the magnitude of eddy current</td> </tr> <tr> <td>Bentuk 'O'</td> <td>to reduce the leakage of electromagnetic flux</td> </tr> <tr> <td colspan="2">T because the ratio is Np:Ns = 200:20 000, type of iron is soft iron core, thinner laminated iron core and O shape iron core</td> </tr> </tbody> </table>	Characteristics	Reason	Np:Ns = 200:20 000	to step-up voltage / output voltage increases	soft iron core	easily magnetized and demagnetized	thinner	to reduce the magnitude of eddy current	Bentuk 'O'	to reduce the leakage of electromagnetic flux	T because the ratio is Np:Ns = 200:20 000, type of iron is soft iron core, thinner laminated iron core and O shape iron core		1 1 1 1 1 1 1 1
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(d)(i)	Total resistance , $R = 10 \Omega \times 800 = 8\,000 \Omega$	1												
(ii)	<p>Power loss in transmission, $P = I^2 R$</p> $= (0.5)^2 \times 8\,000$ $= 2000 \text{ Watt}$	1 1												
(iii)	<p>The Efficiency of the transmission</p> $= \frac{48000}{50000} \times 100\% = 96 \%$	1 1												
TOTAL		20												