MAJLIS PEPERIKSAAN MALAYSIA

SASBADI

LAPORAN PEPERIKSAAN STPM & MUET 2020

Physics (960)

CONTENTS

PHYSICS (960/1)

OVERALL PERFORMANCE

For Semester 1, 1 795 candidates sat for the examination of this subject and 62.00% of them obtained a full pass.

The achievement of the candidates for this subject according to grades is as follows:

Grade	A	A–	B+	B	B–	C+	C	C	D+	D	F
Percentage	10.03	5.35	9.30	9.30	8.86	8.30	10.86	3.40	10.19	3.68	20.72

RESPONSES OF CANDIDATES

SECTION A: *Multiple-Choice*

Answer Keys

Question number	Key	Question number	Key	Question number	Key
1	**A**	6	**B**	11	**C**
2	**C**	7	**B**	12	**D**
3	**A**	8	**A**	13	**C**
4	**B**	9	**D**	14	**D**
5	**D**	10	**D**	15	**C**

General comments

All questions were in the medium range with 30% to 70% of the candidates obtaining the correct answers.

SECTION B AND C: *Structured and Essay Questions*

General comments

In general, the performance of the candidates was satisfactory especially in answering qualitative questions and derivation of expression using physics laws and principles. The candidates' response to the questions that required standard definitions and concepts were much better as compared to questions that required explanation on new situations or making predictions. However, the performance of the candidates in answering quantitative questions was highly commendable. Most of the answers involving calculations were well organized and presented systematically and logically.

Comments on the individual questions

Question 16

In part (*a*), the candidates were given a graph of stress against strain of materials, *X* and *Y*, and they were asked to state the differences in properties and supporting reasons. Most candidates were confused between the differences in properties and the reasons. They wrote reasons in the columns designated for properties of the materials. Some candidates made mistakes by not making comparisons of the properties of the materials or they just mentioned the property of one material without comparing with the other material. However, the candidates were able to give at least one correct difference in property with the correct reason. They were able to differentiate that *X* is brittle and *Y* is ductile with the reason that *X* does not experience plastic deformation while *Y* experiences plastic deformation before breaking. They were also able to differentiate that *X* is stiffer than *Y* with the reason that the gradient of graph *X* is greater than that of *Y*.

SEMESTER 1

In part (*b*), most candidates were able to use the equation, Young's modulus = $\frac{\text{stress}}{\text{strain}}$ correctly to determine Young's modulus of *X*. However, a few candidates failed to give their final answers with the correct unit and the correct number of significant figures.

In part (*c*) most candidates were able to use the equation, stress = $\frac{\text{tensile force}}{\text{cross-sectional area}}$ to determine the required tensile force to break *Y*.

Answers: (*b*) 3.0×10^{11} Pa, (*c*) 157 N

Question 17

In part (*a*), the candidates were able to determine the change in internal energy of the gas cooled at constant pressure. The candidates have to understand that heat liberated at constant pressure is given by $Q = nC_{p,m}\Delta T$ and that the change in internal energy of gas, $\Delta U = nC_{V,m}\Delta T$. Many candidates mistakenly assumed that the heat liberated at constant pressure as $Q = nC_{V,m}\Delta T$ and assumed the number of moles of gas as one. There were candidates who answered correctly by using $Q = nC_{p,m}\Delta T$ to find the number of moles and then substituted it into the equation $\Delta U = \frac{f}{2}nR\Delta T$ to calculate the change in internal energy of the gas.

In part (*b*), most candidates were able to write and use the first law of thermodynamics, $Q = \Delta U + W$, to determine the work done on the gas. Many candidates failed to realise that heat is liberated and did not put a negative sign in their final answer.

In part (*c*), most candidates were able to state that no work is done in this process. However, not many candidates were able to state the decrease in the heat liberated.

Answers: (*a*) 1.79×10^4 J, (*b*) -7.1×10^3 J

Question 18

In part (*a*)(i), most candidates were able to state that during the motion, the direction of the body and the velocity changed. However, many candidates did not relate the rate of change in velocity as the acceleration. This is a key understanding as velocity is a vector quantity, thus any change in direction while the speed is constant will cause a change in the velocity.

In part (a)(ii), most candidates were able to derive acceleration of the circle as $a = \frac{v^2}{r}$. However, some candidates did not realise that the angle, θ, has to be small in order to use the expression, $\Delta v = v\Delta\theta$.

In part (b), most candidates were able to calculate the centripetal force of the steel ball in a horizontal circle using the equation $F = \frac{mv^2}{r}$.

In part (c), the candidates were supposed to know that the centripetal force acting on the object was the sum of the tension and the weight of the object at the highest position of the revolution. The candidates should realise that the speed was minimum when the tension of the string was equal to zero. Many candidates just wrote $v = \sqrt{rg}$ without stating that the tension of the string was equal to zero, so the answer was not accepted since the wrong physics concept was used.

Answers: (b) 1.54 N, (c) 2.10 m s^{-1}

Question 19

In part (a)(i), most candidates were able to state the two assumptions of the kinetic theory of an ideal gas correctly. However, some of them lost marks because they used gas particles instead of gas molecules or atoms.

In part (a)(ii), some candidates used the ideal gas equation, $pV = nRT$ and the equation $\frac{1}{2}m\overline{c^2} = \frac{3}{2}kT$ to show that the pressure exerted by an ideal gas $p = \frac{1}{3}\rho\overline{c^2}$. There were candidates who used assumptions of kinetic theory of ideal gas to show that the pressure exerted by an ideal gas $p = \frac{1}{3}\rho\overline{c^2}$.

In part (b)(i), most candidates were able to use the equation $E_K = \frac{3}{2}kT$ to calculate the average molecular kinetic energy of helium gas atoms and argon under the same condition but some of them mistakenly used the equation of kinetic energy as $\frac{3}{2}RT$.

In part (b)(ii), many candidates were able to use the solution from (b)(i) to determine the r.m.s. speed of helium and argon atoms by equating $E_K = \frac{1}{2}mv^2_{rms}$. There were candidates who used molar mass instead of molecular mass.

In part (c), surprisingly, most candidates were not able to describe the degrees of freedom in a gas successfully. Many candidates described the degree of freedom as an independent way where a gas molecule acquires kinetic energy.

Answers: (b)(i) Both gases have the same average kinetic energy 8.76×10^{-21} J;
(b)(ii) 1.62×10^3 m s^{-1} , 514 m s^{-1}

Question 20

In part (a)(i), most candidates were able to describe the heat conduction through vibration of atom with greater amplitude, collision with neighbouring atoms and diffusion of free electrons from the hot to cold end of the rod. Some candidates lost marks because they used the terms *particles/molecules* in their description. Some candidates wrongly stated that collision between free electrons caused the transfer of heat.

In part (*a*)(ii), most candidates were able to write the equation of the heat conduction, $\frac{dQ}{dt} = -kA\frac{d\theta}{dx}$ correctly. The candidates were also able to state that the rate of heat flow through copper rod is the same as the rate of heat flow through aluminium rod. Hence, most candidates were able to calculate the temperature at the interface of the two rods.

In part (*b*)(i), most candidates were able to state the factors that affected the amount of energy radiated by the object correctly. The answers are surface temperature, surface area, emissivity and time. However, some candidates wrongly wrote that the surrounding temperature was also a factor.

In part (*b*)(ii), most candidates were able to write the equation of power radiated, $P = \sigma\varepsilon AT^4$ and were able to subtract the power emitted by the environment from the power radiated by the object to determine the net rate of energy exchanged for the object. Common mistakes made by candidates were failure to use the absolute temperature in the substitution and wrote $P = \sigma\varepsilon A\left(T_{env}^4 - T_{obj}^4\right)$.

In part (*b*)(iii), most candidates were able to obtain the correct answer using the formula, $\Delta Q = Pt$. Some candidates lost marks because they did not put the correct unit for energy, that is Joule.

Answers: (*a*)(ii) 61.5°C, (*b*)(ii) 923 W; (*b*)(iii) 46.1 kJ

PHYSICS (960/2)

OVERALL PERFORMANCE

For Semester 2, 1 782 candidates sat for the examination of this subject and 60.38% of them obtained a full pass.

The achievement of the candidates for this subject according to grades is as follows:

Grade	A	A–	B+	B	B–	C+	C	C–	D+	D	F
Percentage	10.61	4.26	5.11	4.94	10.66	13.02	11.78	6.85	5.72	3.14	23.91

RESPONSES OF CANDIDATES

SECTION A: *Multiple-Choice*

Answer Keys

Question number	Key	Question number	Key	Question number	Key
1	**C**	6	**A**	11	**B**
2	**A**	7	**D**	12	**C**
3	**D**	8	**C**	13	**B**
4	**A**	9	**B**	14	**D**
5	**C**	10	**D**	15	**B**

General comments

More than 70% of the candidates answered Questions 4, 5, 10 and 13 correctly. Question 2 was very difficult for the candidates, thus less than 30% of the candidates answered it correctly. The rest of the questions were in the medium range with 30% to 70% of the candidates obtaining the correct answers.

SECTIONS B AND C: *Structured and Essay Questions*

General comments

In general, the performance of the candidates was satisfactory especially in answering qualitative questions using physics laws and principles. Visualization and conceptualization skills are vital in exploring knowledge of Physics to a greater extent. The performance of the candidates in answering quantitative questions was highly commendable. Most candidates were able to present their quantitative answers systematically with suitable formulae and did substitution of the correct data. The candidates also realised the importance of writing the units and the answers in suitable number of significant figures.

Comments on the individual questions

Question 16

In part (*a*), most candidates were able to calculate the length of the nichrome wire using the formula, $\rho = \frac{RA}{\ell}$. The candidates knew how to determine the resistance of the wire using the formula, $P = \frac{V^2}{R}$. However, some candidates wrongly calculated the cross-sectional area of the wire.

In part (*b*), most candidates were able to explain the effect of temperature increase on the power dissipated by the coil. The answer is the resistivity of the coil increases, therefore the current flow through the wire decreases and the power dissipated decreases.

Answer: (*a*) 7.54 m

Question 17

In part (*a*), most candidates were able to determine the current measured by the ammeter using the formula, $I = \frac{V}{R_T}$. The value of R_T was determined by adding the resistance of resistor 15 Ω and resistance in the ammeter. However, a few candidates could not obtain the correct answer because rounding up was made too early in the intermediate step.

In part (*b*), most candidates were able to calculate the percentage difference between the measured current and the actual current correctly.

In part (*c*), a few candidates were able to state that the function of shunt is to divert a portion of current from the meter coil, but they were not able to state that the shunt also enables measurement of current larger than the full-scale deflection.

Answers: (*a*) 1.57 A, (*b*) 6.06%

Question 18

In part (*a*), most candidates obtained full marks by giving the correct definition or meaning of the electric field strength at one point.

In part (*b*)(i), most candidates knew how to tackle the question by using a diagram to show the movement of an electron as it enters in a perpendicular direction to the electric field. However, they were not able to explain the reason behind the motion based on the diagram. Many candidates could only obtain the mark on parabolic motion.

In part (*b*)(ii), most candidates were not able to explain the motion of an electron as it entered in the same direction as the uniform electric field. The candidates only stated that the electron moves parallel to the field without giving further reason.

In part (*c*), most candidates were able to determine the magnitude and direction of the electric field strength at point *P*. The candidates knew how to solve the question. They used Pythagoras theorem to obtain the distance *AP* or *BP,* used the formula, $E = \frac{1}{4\pi\varepsilon_o}\frac{q}{r^2}$ to determine electric field strength, *E*, and then used $\tan\theta = \frac{E_x}{E_y}$ to determine the direction of *E*. However, some candidates failed to understand vector as they were required to resolve *E* into the *x*-component and *y*-component and finally determine the resultant of *E*.

Answer: (*c*) 8.04×10^3 N C^{-1}

Question 19

In part (*a*)(i), most candidates were able to give the meaning of the magnetic flux density based on the formula and defined the symbol used correctly.

In part (*a*)(ii), a few candidates were able to explain the existence of magnetic force acting on a conductor. Most of them obtained marks based on the equation, $F = qvB$, which means magnetic force experienced by the charge carriers. However, most of them failed to explain that when a current is flowing in a conductor, the charge carriers are drifting. The charge carriers experience a magnetic force. The force acting on the conductor is equal to the total force acting on all the charge carriers.

In part (*a*)(iii), most candidates were able to derive an expression for magnetic force as $F = BIL\sin\theta$. However, some candidates did not use the symbol given in the question causing them to lose marks.

In part (*b*), most candidates were able to determine the maximum radius of the electron path in the magnetic field using the relationship, $\frac{1}{2}mv^2 = qV$ and $qvB = \frac{mv^2}{r}$.

Answer: (*b*) 6.748×10^{-4} m

Question 20

In part (*a*), most candidates were able to state the Faraday's law and the Lenz's law correctly.

In part (*b*)(i), not many candidates were able to explain why a force is needed to move a rod at a constant velocity in the conducting rail. The candidates did not understand that as a current was induced on the rod, there was a magnetic force that acted on the rod against the motion.

In part (*b*)(ii), most candidates were able to derive the expression using the equation, $\Phi = BA$ and obtained the final expression for the force as $F = \frac{B^2\ell^2v}{R}$.

In part (*b*)(iii), most candidates were able to determine the mechanical power to move the rod using the formula, $P = Fv$. Only a few candidates lost marks because they did not find the power, but the force instead.

Answer: (*b*)(iii) 14.4 W

PHYSICS (960/3)

OVERALL PERFORMANCE

For Semester 3, 1 783 candidates sat for the examination of this subject and 55.18% of them obtained a full pass.

The achievement of the candidates for this subject according to grades is as follows:

Grade	A	A–	B+	B	B–	C+	C	C–	D+	D	F
Percentage	9.20	5.27	6.79	6.39	9.14	7.85	10.54	5.55	5.66	5.95	27.65

RESPONSES OF CANDIDATES

SECTION A: *Multiple-Choice*

Answer Keys

Question number	Key	Question number	Key	Question number	Key
1	**A**	6	**D**	11	**C**
2	**B**	7	**C**	12	**A**
3	**C**	8	**D**	13	**A**
4	**B**	9	**A**	14	**D**
5	**B**	10	**D**	15	**C**

General comments

More than 70% of the candidates answered Questions 3 and 5 correctly. The rest of the questions were in the medium range with 30% to 70% of the candidates obtaining the correct answers.

SECTIONS B AND C: *Structured and Essay Questions*

General comments

In general, the performance of the candidates was satisfactory especially in answering qualitative questions using physics laws and principles. The performance of the candidates in answering quantitative questions was highly commendable. Most of the answers involving calculations were well organized and presented systematically and logically. The candidates also realised the importance of writing the units and the answers in suitable number of significant figures.

Comments on the individual questions

Question 16

In part (*a*), most candidates were not able to describe the formation of maximum and minimum intensities correctly, presumably due to the lack of understanding on the formation of standing wave. However, a few candidates were able to describe it perfectly. The answers are as follows: the sound wave travelled towards the metal plate and then reflected. The waves superposed to form a standing wave. In the standing wave, there were nodes and antinodes where the amplitudes were minimum and maximum respectively.

In part (*b*), most candidates were able to determine the speed of sound in air using the formula $v = f\lambda$. However, some candidates did not know that the distance between successive maximum and minimum intensities was equal to $\frac{\lambda}{2}$. They wrongly wrote wavelength as $\lambda = l$.

In part (*c*), only the good candidates could answer correctly. Most candidates did not understand that there was a phase change of $\frac{\lambda}{2}$ or π radian due to the reflection at the point nearest to the metal plate. Some good candidates mentioned that there was a destructive interference at the end of the plate.

Answer: (*b*) 340 m s^{-1}

Question 17

In part (*a*), most candidates were not able to determine the resolving power of the man's eyes correctly. Most candidates wrongly used the formula, $\theta = \frac{\lambda}{D}$. For circular aperture, the resolving power was given as $\theta = \frac{1.22\lambda}{D}$. This was quite surprising since the candidates should know the difference between them.

In part (*b*), most candidates were able to determine the maximum distance between the man and the car when yellow light by using the formula, $\theta = \frac{d}{L}$. But a few of them used the wrong formula, $\lambda = \frac{ax}{D}$, due to the superposition.

In part (*c*), most candidates were able to explain that the blue light has shorter wavelength and the maximum distance was increased, but a majority of them failed to state that the resolving power is higher. It seems that many candidates did not know that resolving power is inversely proportional to the wavelength.

Answers: (*a*) 2.32×10^{-4}; (*b*) 4 310 m

Question 18

In part (*a*), only a few candidates were able to state the differences and similarities of electromagnetic waves and mechanical waves. They were able to state that electromagnetic waves can propagate in vacuum while mechanical waves need a medium to propagate. Some candidates stated the differences between progressive wave and stationary wave instead of electromagnetic wave and mechanical wave. Some candidates also wrongly stated that the mechanical waves as transverse wave only. Most candidates also did not know the similarities of electromagnetic wave and mechanical wave, which are the waves propagate/move during the propagation and caused by disturbance/vibration.

In part (*b*), most candidates were able to calculate the velocity of the wave using the formula, $v = f\lambda$. From the value of the velocity, which was less than the speed of light, the candidates successfully determined that the wave was a mechanical wave.

In part (*c*), most candidates were able to write the relationship of amplitude of the wave after the wave propagates through a distance *r*. But they did not know that the intensity was directly proportional to the square of amplitude. Thus, the candidates were not able to determine the intensity of the wave at *r*.

In part (*d*), most candidates were able to state the reason for the reduced amplitude as the wave propagates at a further distance from source. They wrote due to energy loss but a few of them used the term damping.

Answers: (*b*) 29.8 m s^{-1}; (*c*) $I = 0.81I_0$

Question 19

In part (*a*)(i), most candidates were not able to sketch the ray diagram for the path of light rays correctly but they were able to show the position of the image formed. However, many candidates were able to state the characteristic of the image formed correctly. The most obvious mistake was the candidates did not draw the principal axis where the reflection occurred.

In part (*a*)(ii), most candidates were able to calculate the height of the image using the formula $m = \frac{h_1}{h_0}$. At first, the candidates calculated the distance of the image using the formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$ and then determine the magnification of the image. However, there was a handful of candidates who rounded off the intermediate answer too early and thus, gave the final answer wrongly.

In part (*b*)(i), most candidates were able to determine the ratio of the height of the image. The candidates started by using the lens maker formula to calculate the focal length, $\frac{1}{f} = \left(\frac{n_2}{n_1} - 1\right)\left(\frac{1}{r_1} - \frac{1}{r_2}\right)$, then they used the value of focal length to calculate the object distance using the formula $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$. Some candidates wrongly calculated the focal length by using the refraction at curve surface equation $\frac{n_2}{v} - \frac{n_1}{u} = \frac{n_2 - n_1}{r}$. Most of them only solved half of it, which was the refraction at one surface and forgot to determine the final image of refraction at another surface, thus causing their answer to be wrong.

In part (*b*)(ii), most candidates were not able to explain the results of the experiment if the whole set up was placed in water. They forgot that the refractive index of water is higher than refractive index of air, causing the height of the image to become shorter and the new focal length to become longer.

Answers: (*a*)(ii) 2.22 cm; (*b*)(i) 9.0

Question 20

In part (*a*), most candidates were able to describe the production of a characteristic spectrum of X-rays. However, there were some candidates who wrongly described the production of a continuous X-rays.

In part (*b*)(i), most candidates were able to calculate the minimum wavelength of the X-rays. The candidates knew the relationship of $qV = \frac{hc}{\lambda_{min}}$. However, some candidates were confused by using kinetic energy, $\frac{1}{2}mv^2$ instead of electrical potential energy, qV.

In part (*b*)(ii), most candidates were able to state that λ_{min} decreased as the potential difference was increased.

In part (*c*)(i), most candidates were able to determine the wavelength of the X-ray by using the Bragg equation $2d \sin\theta_m = m\lambda$. Only a few candidates wrongly used the equation $d \sin\theta = m\lambda$.

In part (*c*)(ii), most candidates were able to determine the maximum order of constructive interference. The candidates knew how to deduce $\frac{2d}{\lambda} = m$ to get the maximum value of m. Some candidates obtained the correct answer of 2 but wrote the final answer as total fringes of 2 + 2 + 1 = 5, which showed that the candidates were confused with the diffraction grating calculations.

In part (*c*)(iii), only a handful of candidates were able to describe X-ray diffraction by two parallel adjacent atomic planes. Some candidates described using the atomic plane diagram and proved that the optical difference for constructive interference was $2d \sin\theta = m\lambda$. However, some candidates drew diagram without atoms that did not clearly show the diffraction or reflection that happened. Some candidates did not explain the interference or superposition that happened and did not give the path difference.

Answers: (*b*)(i) 5.405×10^{-11} m; (*c*)(i) 2.384×10^{-10} m; (*c*)(ii) 2

PAPER 960/5 (WRITTEN PRACTICAL TEST)

Question 1

In part (*a*), most candidates were able to calculate the corresponding values of the horizontal distance, x^2 with consistent significant figure to primary data.

In part (*b*), most candidates were able to plot a graph of x^2 against H with axes correctly labelled with units and with suitable scale. All the points were correctly plotted. The candidates were also able to draw the best straight line through the plotted points.

In part (*c*), most candidates were able to calculate the gradient with triangle size covering more than $\frac{1}{3}$ of the graph paper. However, almost all candidates did not obtain a full mark because of incorrect points taken and did not give any unit or wrote incorrect unit.

In part (*d*), most candidates recognised that the gradient of the graph was equal to $\frac{2u^2}{g}$ and were able to calculate the value of u. However, some candidates mistakenly calculated the simple expression.

In part (*e*), most candidates were able to determine the value of u by using $\frac{1}{2}mu^2 = mgh$. However, there were some candidates who simplified the equation to $u = \sqrt{2gH}$.

In part (*f*), most candidates were not able to explain the reasons clearly for the difference between the values of u in (*d*) and (*e*). They failed to realise the energy loss due to friction of the track and air resistance.

In part (*g*), most candidates correctly stated the precautions that should be taken to improve the result of the experiment, that is, use a smaller marble and avoid giving initial speed to the marble.

Answers: (*c*) 1.935 m; (*d*) 3.08 m s^{-1}; (*e*) 3.13 m s^{-1}

Question 2

In part (*a*), almost all candidates were able to calculate the value of V with consistent significant figure to primary data.

In part (*b*), most candidates were able to plot a large graph of V against R with correctly labelled axes and all the points were correctly marked. The candidates were also able to draw the best fit curve through the plotted points. It was important that the candidates selected sensible scales.

In part (*c*), most candidates were not able to correctly give the comment that the voltage will reach a maximum value, which was equal to the e.m.f. of the accumulators.

In part (*d*)(i), most candidates were able to correctly read off the y-intercept at $x = 0$ directly from the graph of I against R, but some candidates incorrectly read off the y-intercept when there was a false origin. Almost half of the candidates were able to estimate the internal resistance of the battery for question (*d*)(ii). The weaker candidates did not realise the usage of formula $R = \frac{V}{I}$.

In part (*e*), only a few candidates were able to determine the efficiency of the circuit when the value of R was equal to the value of r. Candidates were not able to manipulate the expression of efficiency, $\eta = \frac{VI}{EI}$ to become $\eta = \frac{R}{R + r}$.

In part (*f*), most candidates were able to state the errors that affected the accuracy of the experiment, which were zero error of the ammeter and the accumulator was not fully charged.

In part (*g*), most candidates successfully recognised the advantage of using accumulator compared to dry cell as the accumulator has lower internal resistance.

Answers: (*d*)(ii) 1.9 Ω; (*e*) 51%

SEMESTER 3

Question 3

In part (*a*), most candidates were able to calculate the values of $\sin\theta$ in the table given with the correct significant figures.

In part (*b*), most candidates gained credit for drawing appropriate axes, with labels and suitable scales for the graph of $\sin\theta$ against n. The line of best fit passed through both the lowest and highest points for these data.

In part (*c*)(i), most candidates clearly demonstrated the points that they used to calculate the gradient. Some candidates misread coordinates or did not use a suitable size triangle. Many candidates calculated the wavelength correctly in part (*c*)(ii).

In part (*d*), most candidates did not know the precautionary measures for the experiment. The clearly reasoned precautions relevant to the experiment were the diffraction grating and screen must be exactly vertical and the screen must be parallel to the plane of the diffraction grating.

In part (*e*), surprisingly, all the candidates were not able to suggest a way to measure the separation x between the 0 order and n^{th} order accurately if the bright spots have certain diameters.

In part (*f*), not many candidates were able to comment on the accuracy of the result if L was changed to 80 cm. The answers are the result become less accurate and the values of x become smaller.

Answers: (*c*)(i) 0.065; (*c*)(ii) 6.50×10^{-7} m

LAPORAN PEPERIKSAAN STPM & MUET 2020

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