NAMA:	TINGKATAN: 5 Ud
NO. KAD PENGENALAN	

SEKOLAH MENENGAH KEBANGSAAN ST. LUKE
SRI AMAN

PEPERIKSAAN PERCUBAAN SPM 2019

Fizik Tingkatan Lima
Kertas 1

4531/1

1 ¼ Jam

Satu jam lima belas minit

JANGAN BUKA KERTAS SOALAN INI SEHINGGA DIBERITAHU

1. *Kertas soalan ini mengandungi 50 soalan.*
2. *Jawab semua soalan.*
3. *Jawab dengan menghitamkan ruangan yang betul pada kertas jawapan.*
4. *Bagi setiap soalan hitamkan satu ruangan sahaja.*
5. *Sekiranya anda hendak menukarkan jawapan , padamkan tanda yang telah dibuat. Kemudian hitamkan jawapan yang baru*
6. *Satu senarai rumus disediakan di halaman 2*
7. *Penggunaan kalkulator saintifik yang tidak boleh diprogramkan adalah dibenarkan*

The following information may be useful. The symbols have their usual meaning.

1. $a = \frac{v-u}{t}$

2. $v^2 = u^2 + 2as$

3. $s = ut + \frac{1}{2}at^2$

4. Momentum = mv

5. $F = ma$

6. Kinetic Energy / *Tenaga Kinetik*

   $= ½\ mv^2$

7. Gravitational Potential Energy / *Tenaga keupayaan graviti*$= mgh$

8. Elastic Potential Energy / *Tenaga keupayaan kenyal* $= \frac{1}{2}Fx$

9. Power, $P = \frac{energy}{time}$

   Kuasa, $P = \frac{tenaga}{masa}$

10. $\rho = \frac{m}{V}$

11. Pressure / *Tekanan*, $P = \frac{F}{A}$

12. Pressure in liquid / *Tekanan dalam cecair*, $P = h\rho g$

13. Heat / *Haba*, Q = $mc\theta$

14. Heat / *Haba*, Q = $m\ell$

15. $\frac{pV}{T}$ = constant / *pemalar*

16. $n = \frac{\sin i}{\sin r}$

17. $n = \frac{\text{real depth}}{\text{apparent depth}}$

    $n = \frac{\text{dalam nyata}}{\text{dalam ketara}}$

18. $\frac{1}{f} = \frac{1}{u} + \frac{1}{v}$

19. Linear magnification / *Pembesaran linear*, $m = \frac{v}{u}$

20. $v = f\lambda$

21. $\lambda = \frac{ax}{D}$

22. $Q = It$

23. E = VQ

24. $V = IR$

25. Power / *Kuasa,* $P = IV$

26. $g = 10\ ms^{-2}$

27. $\frac{N_S}{N_P} = \frac{V_S}{V_P}$

28. Efficiency / *Kecekapan*

    $= \frac{I_S V_S}{I_P V_P} \times 100\%$

29. $E = mc^2$

1. Table below shows a set of physical quantities.

Mass	Speed	Temperature	Time

All the quantities can be categorized as

A base quantity
B scalar quantity
C vector quantity
D derived quantity

2. The volume of a bottle of water is 500 cm^3. What is the value in SI unit?

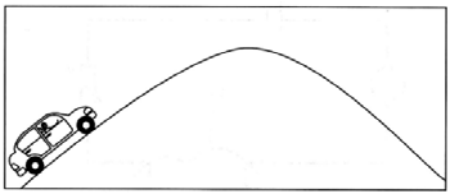
A 0.0005 m^3
B 0.005 m^3
C 0.05 m^3
D 0.5 m^3

3. Diagram below shows the distribution of gunshots fired on a target board.

Which of the following explains the gunshots distribution on the target board correctly?

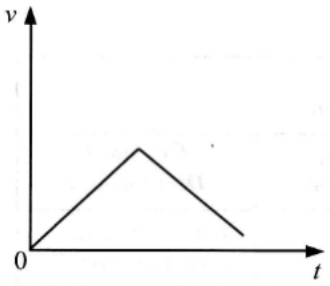
	Consistence	Accuracy
A	High	High
B	Low	Low
C	High	Low
D	Low	High

4. Diagram below shows a car moving up a hill. The car decelerates as it moves up the hill and accelerates as it moves down the hill.

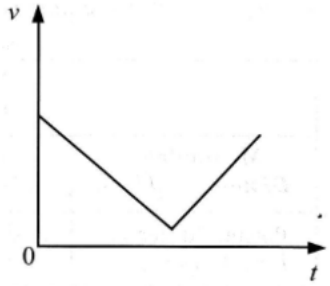


Which graph shows the correct relationship between the velocity, *v*, of the car and the time, *t*, of the motion?

A



B



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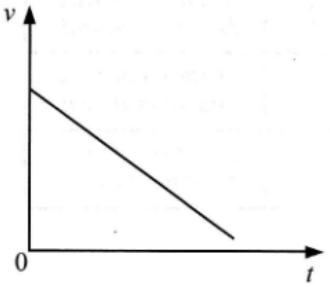

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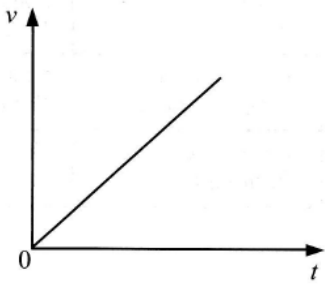


5. Diagram below shows the reaction of drivers of driver and passenger when a car stops immediately.

This phenomenon is caused by

A inertia of the car.
B motion force of the car,
C inertia of the passengers.
D Reaction force of the passenger.

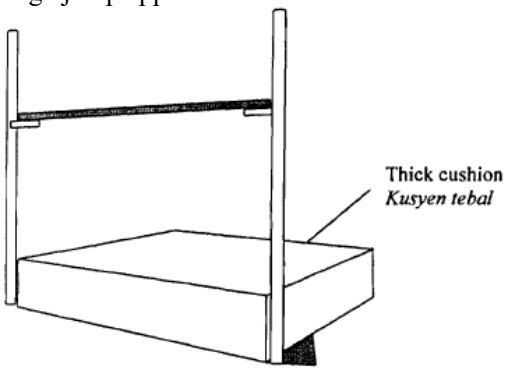
6. The principle of conservation of momentum is applied in which action?

A 
B 
C 
D 

7. Which of the following is not the effect of a force that is applied to the moving toys car?

A The toy car speeds up
B The toy car stopped
C The toy car change direction
D The mass of the toy car decreases

8. Diagram below shows a set of high jump apparatus.



The thick cushion is used to reduce the

A increses the impulse on the body of the athlete.
B reduce the impulsive force on the body of the athlete.
C increase the performance of the atlet.
D reduce the time of impact between the athlete and the cushion.

9. Diagram below shows a car involved in an accident.

Why is its front sections designed to crumple easily?

A It can increase the impulsive force
B It can decrease the impulsive force
C It can increase the momentum of the car
D It can decrease the time of impact

10. When an object is in equilibrium of forces, the object

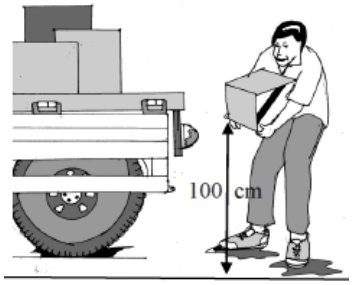
A must be stationary
B must move with a uniform velocity
C is either stationary or moving with a uniform velocity
D either moves with a uniform velocity or with a uniform acceleration

11. Diagram below shows a stone is thrown vertically upwards at a velocity of 20 m s^{-1}.

What is the maximum height achieved by the stone?

A 2 m
B 19 m
C 20 m
D 40 m

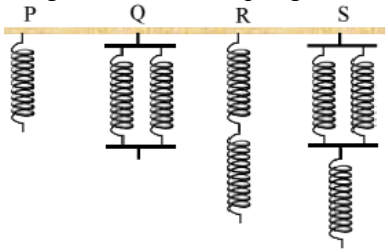
12. Diagram below shows a man lift up a 10 kg object.



What is the work done by the man?

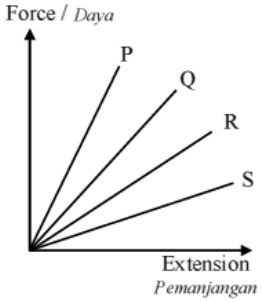
A 10 J
B 100J
C 1000 J
D 10000 J

13. Diagram below shows four spring arrangements. All the springs are identical.



Which group of force-extension graph is correct for P, Q, R and S if 1 kg loads are attached to each spring?

A



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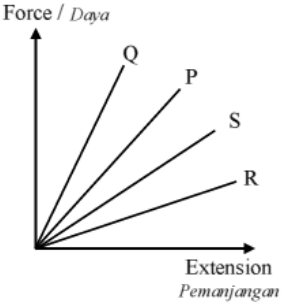

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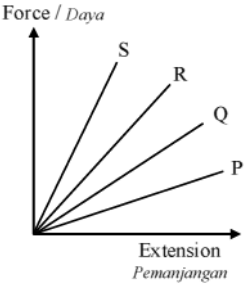

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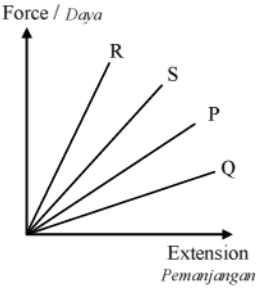
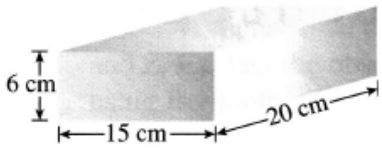


14. The following statements are the reason that a device usually cannot have a 100% efficiency **except**
A some of the energy are lost
B some of the energy are use to do work
C some of the energy are change to thermal energy
D some of the energy are change to sound energy

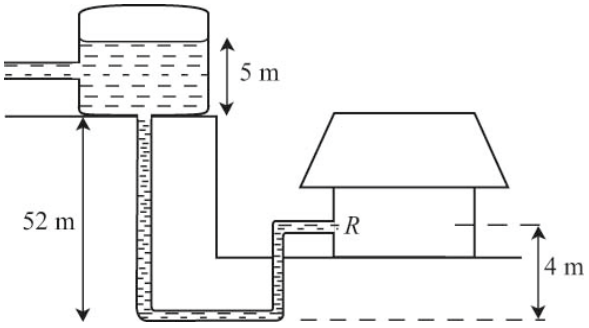
15. A metal block with the dimensions of 6 cm × 15 cm × 20 cm has a mass of 2.4 kg.



What is the possible minimum and maximum pressure applied by the block on the floor where it is placed?

	Minimum pressure / Pa	Maximum pressure / Pa
A	600	2000
B	800	2667
C	2000	2667
D	2000	3600

16. Diagram below shows a water reservoir supply water to a house.



Given the density of water is 1000 kg m^{-3}. Calculate the pressure of the water supplied at point *R,* in Pa.

A 5.2×10^5
B 5.3×10^5
C 5.7×10^5
D 6.3×10^5

17. Diagram below shows suction pumps are used to lift a windowpane.

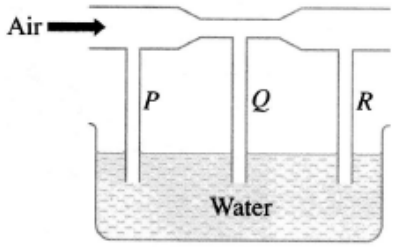
Why does the windowpane stick to the suction pumps?
A Atmospheric pressure > pressure inside the suction pumps
B Atmospheric pressure = pressure inside the suction pumps
C Atmospheric pressure < pressure inside the suction pumps
D Atmospheric pressure = air pressure + pressure inside the suction pumps

18. Diagram shows a hydraulics jack

Which principle is used in this system?

A Pascal's principle
B Bernoulli's principle
C Archimedes' principle
D Charles' principle

19. Diagram below shows a fast stream of air travelling in a tube.



If the water level at point *P*, *Q* and *R* are h_P, h_Q and h_R respectively, choose the correct answer from the following.

A $h_P > h_Q > h_R$
B $h_Q > h_R > h_P$
C $h_R > h_P > h_Q$
D $h_P > h_R > h_Q$

20. Diagram below shows a spoon is place in a bowl of soup at 95 ºC.

Which statement is correct when thermal equilibrium is reached?

A Temperature of soup is unchanged
B Temperature of spoon is unchanged
C No flow of heat between soup and spoon
D Soup and spoon has the same temperature

21. Table below shows the masses of substances P, Q, R and S, the heat energy supplied to each of them and the rise in temperature of each of them.

Substance	Mass / kg	Heat energy / J	Rise in temperature / ºC
P	1.0	1000	5.0
Q	2.0	2000	1.0
R	0.5	1000	4.0
S	1.0	2000	3.0

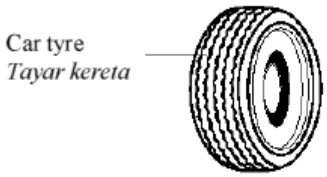
Which of them has the highest specific heat capacity?

A P
B Q
C R
D S

22. Melting, solidification, boiling and condensation are four processes that involve the change of phase of a substance. During which processes is latent heat released by the substance?

A Melting and boiling
B Melting and condensation
C Solidification and condensation
D Solidification and boiling

23. Diagram below shows a car tyre and the air pressure in the type is 220 kPa.



After a long journey, the pressure of the air in the same tyre is found to be 240 kPa.
Which law can explain the change in the air pressure?

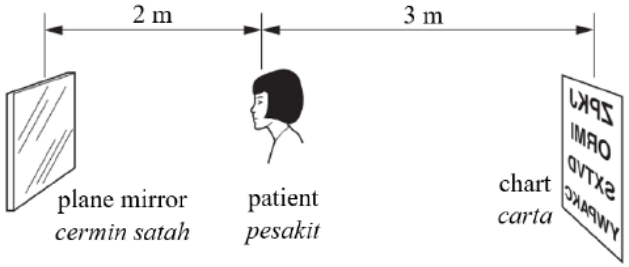
A Pressure law
B Charles' law
C Boyle's law
D Pascal's law

24. Diagram below shows a side mirror of a car. The side mirror is used to see objects coming from behind.

Which physics concept explains this situation?

A Interference of light
B Diffraction of light
C Refraction of light
D Reflection of light

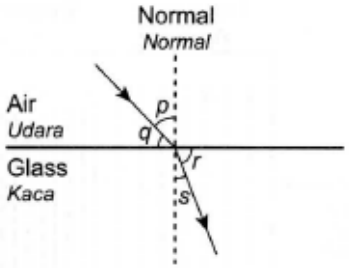
25. Diagram below shows a patient having her eyes tested. A chart with letters on it is placed behind her and she sees the chart reflected in a plane mirror.



How far away the image of the chart from the patient is?

A 2 m
B 4 m
C 5 m
D 7 m

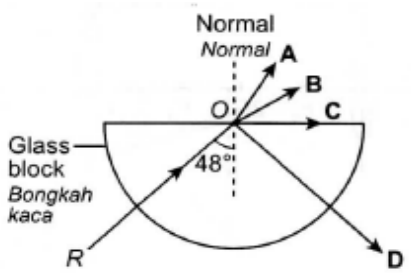
26. Diagram below shows a ray of light entering a block of glass.



The refractive index of the glass block is determined by

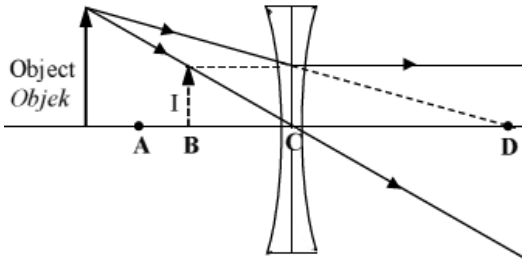
A $\frac{\sin p}{\sin r}$
B $\frac{\sin p}{\sin s}$
C $\frac{\sin q}{\sin r}$
D $\frac{\sin q}{\sin s}$

27. Diagram below shows a light ray, *R* is directed to the centre, *O* of semicircular glass block. The critical angle of the glass is 42°.



At which direction A, B, C or D does the light propagate after point *O*?

28. Diagram below shows the image, I, formed by a concave lens.

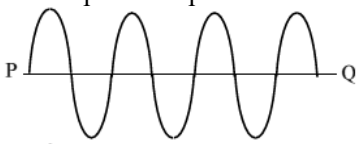


Which point, A, B, C or D is the focal point of the lens?

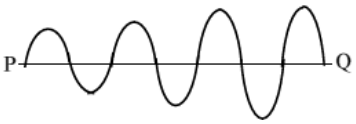
29. Diagram below shows water waves moving towards an barrier with an opening.

Which wave pattern represents the wave from P to Q?

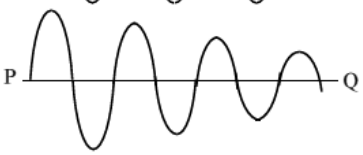
A



B



C



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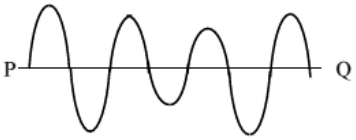
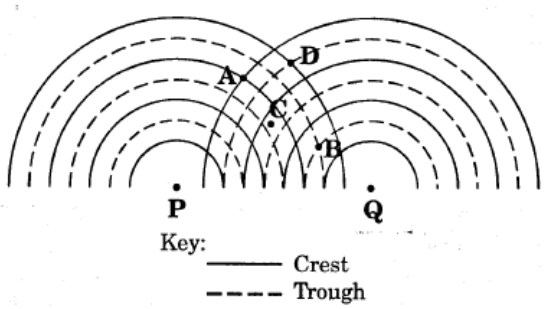
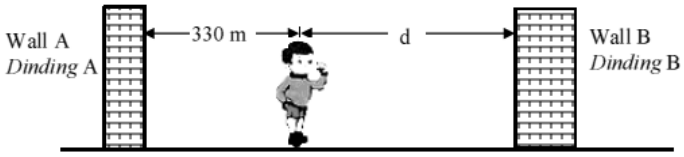


30. Diagram below shows an interference pattern of water waves from two coherent sources P and Q.



Which point is the node?

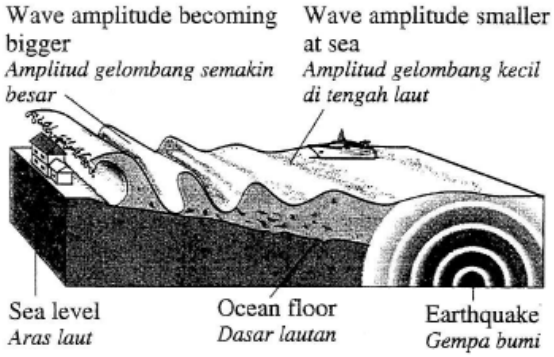
31. Diagram below shows a boy shouting and hearing an echo from each of the wall. The time interval between the two echoes is 1 s.



What is the distance between the boy and wall B?
[Velocity of sound = 330 m s^{-1}]

A 248 m
B 350 m
C 495 m
D 990 m

32. Diagram below shows a tsunami formed by an earthquake or volcanic eruption that occurs at the ocean floor. A large volume of water is displaced to produce a series of water waves with increasing amplitude as they move nearer to the shore.



Which statement about tsunami is correct?

A The energy of the water waves decreases as the amplitude increases
B The energy produced by an earthquake or a volcanic eruption is spread by the water particles around the shore.
C The energy produced by an earthquake or a volcanic eruption at sea is transferred by the particles in the water waves to the shore.
D The energy and amplitude of the water waves increase due to the superposition effects between the water waves.

33. What is the common characteristic between gamma-ray, microwaves waves, and infrared?

A amplitude
B frequency
C speed
D wavelength

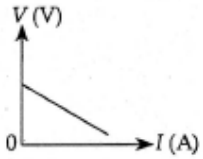
34. Diagram below shows a student touching the dome of the Van de Graff generator which produces positive charge on the dome.

Why does her hair stand straight?

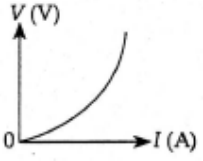
A The negative charges from her body flow to the Van de Graff generator, thus leaving all the positive charges on her hair repelling each other.
B The positive charges from her body flow to the Van de Graff generator, thus leaving all the negative charges on her hair repelling each other.
C The positive charges from the Van the Graff flow to her body, thus her hair now is positively charged and repels each other.
D The negative charges from the Van the Graff flow to her body, thus her hair now is negatively charged and repels each other.

35. Which graph obeys the Ohm's law?

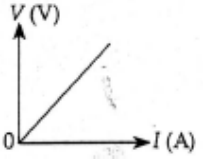
A



B



C



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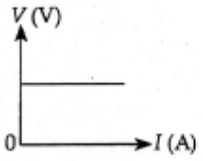
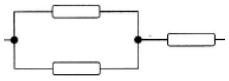
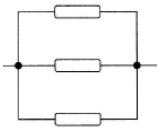


36. The diagrams show four circuits which are set up with similar resistors.
Which circuit will produce the highest effective resistance?

A



B



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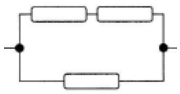
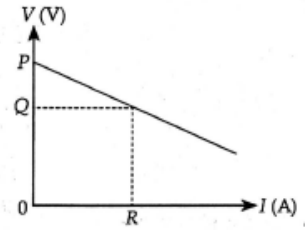


D

37. Diagram below shows the result obtained from an experiment to determine the electromotive force, *E* and the internal resistance, *r* of a dry cell.



Which of the following shows the correct values of *E* and *r*?

	E	***r***
A	P	$\frac{Q-P}{R}$
B	Q	$\frac{R}{(P-Q)}$
C	P	$\frac{P}{Q}$
D	Q	$\frac{-(Q-P)}{R}$

38. Below is a conversation between Sammy and his father.

> Sammy : Daddy, how does this mobile phone charger work?
> Father : By reducing voltage supplied to our home from home from 240 V to 12 V.
> Sammy : Does it function the same as the transformer in an electrical substation?
> Father : Yes.

Why is the size of the transformer in an electrical substation bigger than that of a mobile phone charger?

A Voltage depends on the number of turns of the transformer coil
B Voltage depends on the size of the transformer coil
C Voltage depends on the diameter of the transmission cable
D Voltage depends on the type of the transmission cable

39. Diagram (a) and Diagram (b) shows bulb P and bulb Q are connected to 12 V power supply.

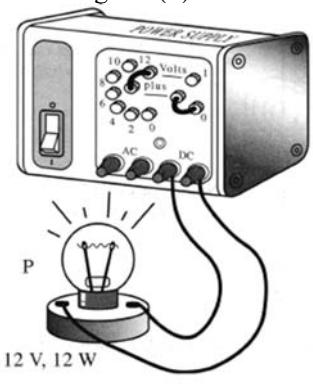


Diagram (a)

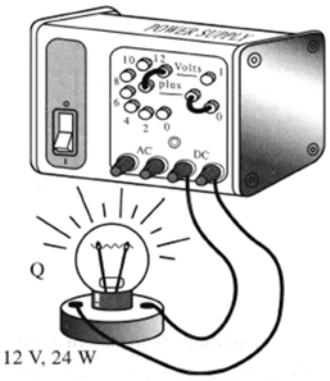
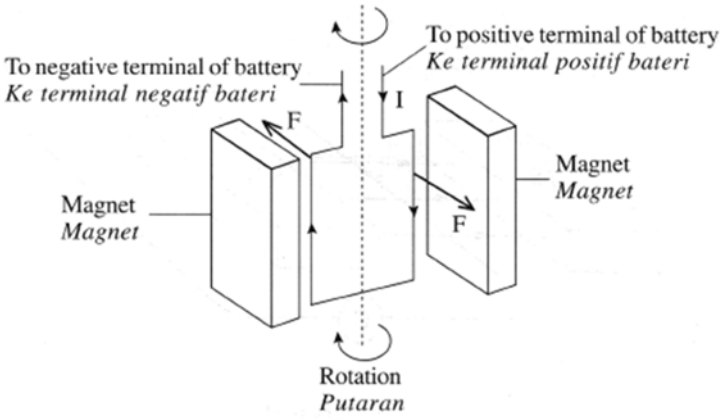


Diagram (b)

Bulb Q is brighter than bulb P because

A bulb P produces more waste of energy
B bulb Q produces less waste of energy
C bulb Q consumes more energy in 1 second
D bulb P consumes more energy in 1 second

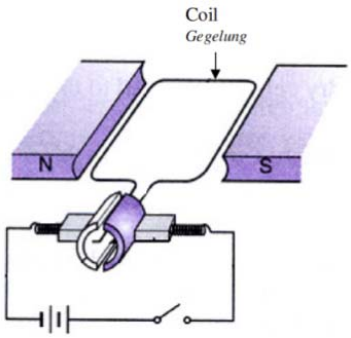
40. Diagram below shows a coil wire in a magnetic field.



The rate of rotation of the coil increases when the

A current is increased
B vertical length of coil is increased
C distance between magnets is increased
D thickness of both magnets is increased

41. Diagram below shows a coil placed between the poles of a permanent magnet and is connected to the external circuit.



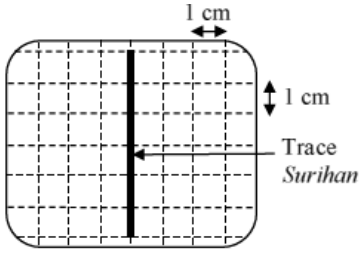
Determine the direction of rotation of the coil when the switch is closed.

A Clock wise
B Anti clock wise
C Alternately, anticlockwise then clockwise
D Alternately, clockwise then anticlockwise

42. Which characteristics are the most suitable for transmission of electricity through the National Grid Network?

	Type of current	Magnitude of voltage
A	Direct current	Very high
B	Direct current	Small
C	Alternating current	Small
D	Alternating current	Very high

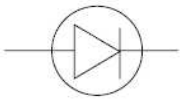
43. Diagram below shows a trace on the screen of a cathode ray oscilloscope.



Which statement is correct to explain the trace produced?

A Both Y-input and time base are switched off
B Y-input is connected to battery and the time base is switched off
C Y-input is connected to alternating current power supply and the time base is switched off
D Y-input is connected to alternating current power supply and the time base is switched on

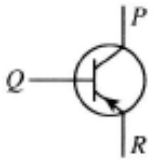
44. Diagram below shows an electronic symbol representing an electronic component.



What is the electronic component?

A Diode
B Capacitor
C Resistor
D Transistor

45. Diagram below shows the symbol for a transistor. What are the names of terminals *P*, *Q* and *R*?



	P	*Q*	*R*
A	Collector	Base	Emitter
B	Collector	Emitter	Base
C	Base	Collector	Emitter
D	Emitter	Base	Collector

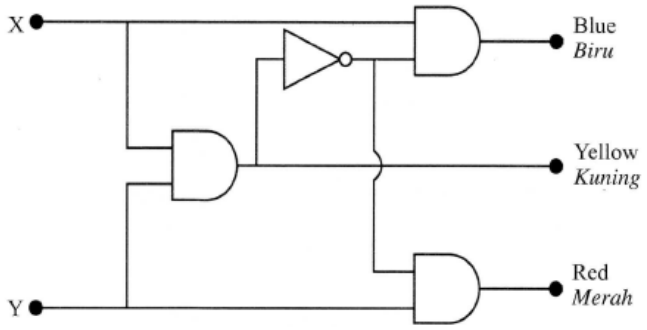
46. The following equation shows a fission process of uranium-235. The mass defect is 0.202 u.

$$^{235}_{92}\text{U} + {}^{1}_{0}\text{U} \rightarrow {}^{141}_{56}\text{Ba} + {}^{92}_{36}\text{Kr} + 3\,{}^{1}_{0}\text{n}$$

What is the nuclear energy released?
[$c = 3 \times 10^8$ m s^{-1}, 1 u = 1.66×10^{-27} kg]

A 1.00×10^{-19} J
B 3.02×10^{-11} J
C 1.82×10^{-10} J
D 7.74×10^{10} J

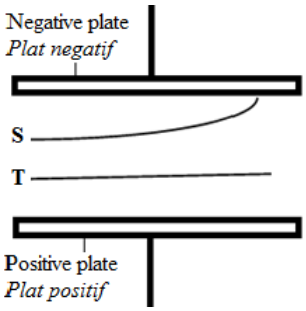
47. Diagram below shows a combination of logic gates for a system with three different colours of LED bulbs.



If both of the input X and Y are "1", which LED bulb will light up?

A Yellow **B** Blue
C Red **D** All light up

48. Two types of radioactive emission are deflected in an electric field as shown in the diagram below.



What are the type of emissions S and T?

	Emission S	Emission T
A	alpha particles	gamma rays
B	beta particles	gamma rays
C	gamma rays	alpha particles
D	gamma rays	beta particles

49. The nuclear medical imaging technique involves the injection of the radioisotope into a patient body. Table 1 shows the characteristics of the radioisotope.

Radioisotope	Half-life	Radiation emitted
P	3 hours	Low energy alpha particles
Q	6 hours	Low energy gamma rays
R	15 days	High energy beta particles
S	130 days	High energy gamma rays

.

Which of the following radioisotope is the most suitable to be injected into patient body?

A P **B** Q
C R **D** S

50. Radioactive waste is harmful to human being because

A It can explode if not handle with correct procedure
B It emits dangerous radiation and has long half-life
C It remains very hot for a long period of time
D It can leak out of containers

END OF QUESTION PAPER

Answers:
(Pep. Percubaan SPM 2019-Phy F5-P1)

1	**B**	11	**C**	21	**B**	31	**C**	41	**A**
2	**A**	12	**B**	22	**C**	32	**C**	42	**D**
3	**C**	13	**B**	23	**A**	33	**C**	43	**C**
4	**B**	14	**A**	24	**D**	34	**A**	44	**A**
5	**C**	15	**B**	25	**D**	35	**C**	45	**A**
6	**D**	16	**A**	26	**B**	36	**D**	46	**B**
7	**D**	17	**A**	27	**D**	37	**A**	47	**A**
8	**B**	18	**A**	28	**D**	38	**A**	48	**A**
9	**B**	19	**B**	29	**C**	39	**C**	49	**B**
10	**C**	20	**D**	30	**B**	40	**A**	50	**B**