Candidate Name: _____ Index No: _____ Class: _____

ZHENGHUA SECONDARY SCHOOL
PRELIMINARY EXAMINATION 2023
SECONDARY FOUR EXPRESS
PHYSICS 6091/01

Paper 1 Multiple Choice 29 August 2023

1 hour

Additional Materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Write in soft pencil.
Do not use staples, paper clips, glue or correction fluid.
Write your name, index number and class on the Answer Sheet in the spaces provided unless this has been done for you.

There are forty questions on this paper. Answer all questions. For each question there are four possible answers A, B, C and D.
Choose the one you consider correct and record your choice in soft pencil on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
Any rough working should be done in this booklet.
The use of an approved scientific calculator is expected, where appropriate.

The total score for this paper is 40 marks.
Name of Setter: Mr. Derek Lim

1 Fig. 1.1 show the readings for the measurement of the internal diameter of a metal pipe and Fig.1.2 shows the measurement of the external diameter of a metal pipe.

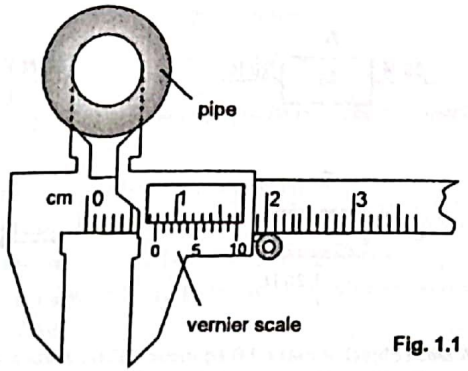


Fig. 1.1

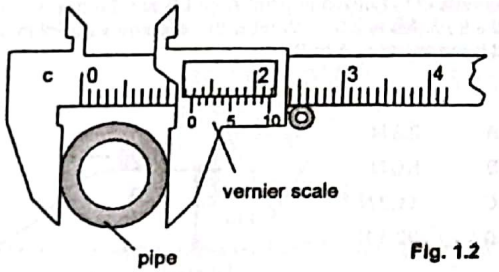
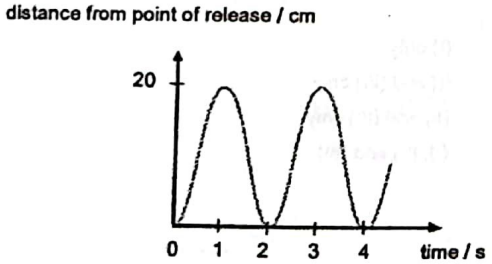


Fig. 1.2

What is the thickness of the pipe?

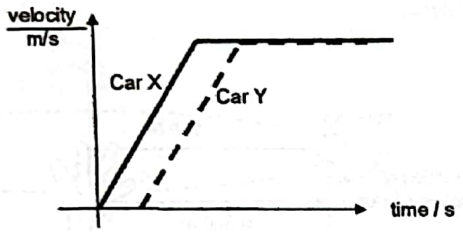
A 0.25 cm B 0.39 cm
C 0.50 cm D 0.64 cm

2 A pendulum bob is pulled to one side and released. The motion during its swing is shown in the diagram below. What is the period of the pendulum?



A 1.0 s B 2.0 s
C 3.0 s D 4.0 s

3 The diagram shows the velocity of two cars Car X and Car Y over a period of time. From the information given, which statement is correct?



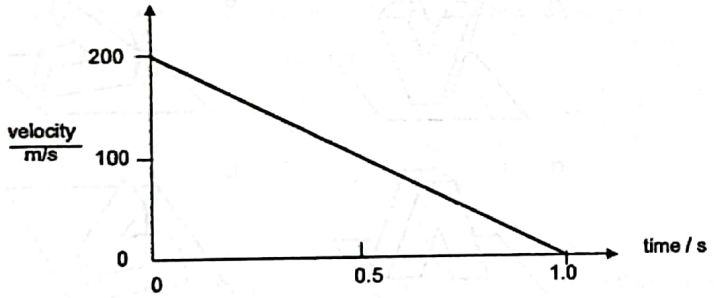
A Car X accelerates faster than car Y.

B Car X travels the same distance as car Y within the same given time.

C Car X accelerated at the same rate as car Y.

D Car X and Car Y always travel at constant velocity.

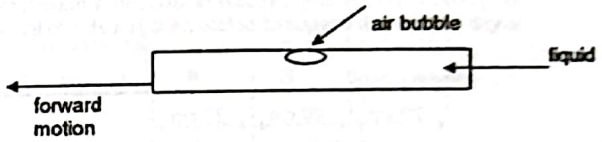
4 The diagram shows how the speed of a bullet varied as it penetrated a layer of concrete.



Given that the mass of the bullet is 300 g, determine the values for the deceleration and the corresponding force acting on the bullet.

	deceleration (m/s²)	force (N)
A	100	60
B	200	60
C	100	60 000
D	200	60 000

5 A spirit level is made of a sealed glass bulb with a small air bubble floating on the liquid inside.



What would be the motion of the air bubble if the spirit level was stopped suddenly?

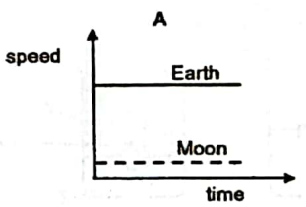
A The air bubble will move forward.

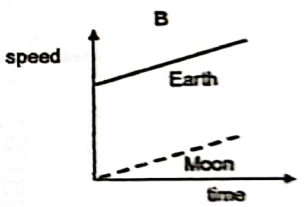
B The air bubble will remain at the original position.

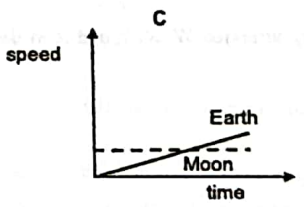
C The air bubble will move backwards.

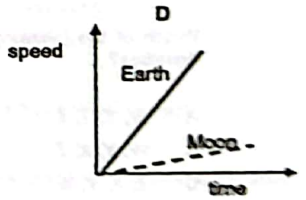
D The motion of air bubble cannot be determined because the total mass of the liquid is unknown.

6 When a rock is dropped on Earth, it accelerates at about 10 m/s². When a rock is dropped on the Moon, the rock accelerates at about 1.6 m/s². Which figure shows the speed-time graph for the rocks dropped on the Earth and the Moon?

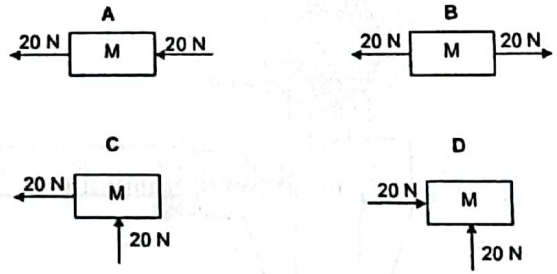






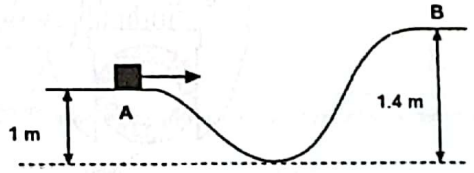


7 Two forces of 20 N act on a moving body of mass M. Which diagram would produce a constant velocity for a moving body?



8 A small object of mass 2.0 kg moves along a track as shown in the diagram below. The speeds of the object at point A and B are 4.0 m/s and 1.0 m/s respectively. The length of the track AB is 2.5 m. What is the average value of frictional force acting on the object as it is moving from A to B?

A 2.8 N
B 5.6 N
C 11.2 N
D 22.4 N

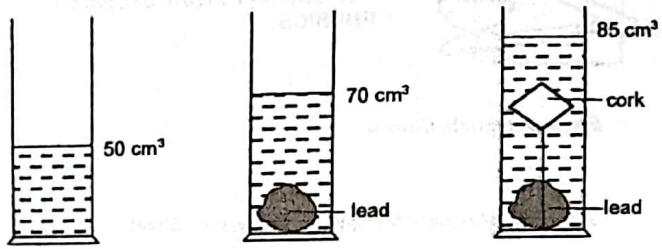


9 A body falls freely under the action of gravity. Which statement concerning its energy is/are correct? Assume that air resistance is negligible, _____.

(I) it gains kinetic energy while falling
(II) its total energy at any point of the flight is equal to the initial energy at the top of its flight
(III) its gravitational potential energy at the end of the flight before it hit the ground is all converted to kinetic energy

A (I) only
B (I) and (III) only
C (II) and (III) only
D (I), (II) and (III)

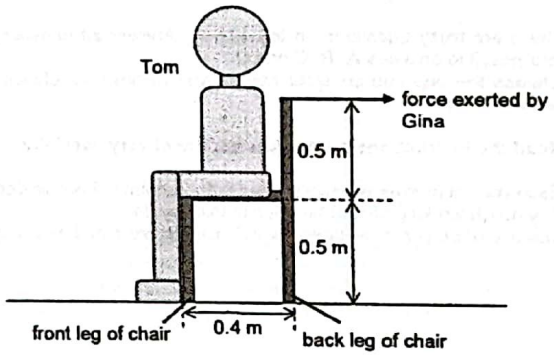
10 An experiment was conducted to find the density of a piece of cork which has a mass of 3.6 g. In order to submerge the cork totally in water, it was tied to a piece of lead which has a mass of 220 g. The water levels for the various stages of the experiment are as shown in the diagram below.



What is the density of the cork in g/cm³?

A 0.10 B 0.18
C 0.24 D 0.50

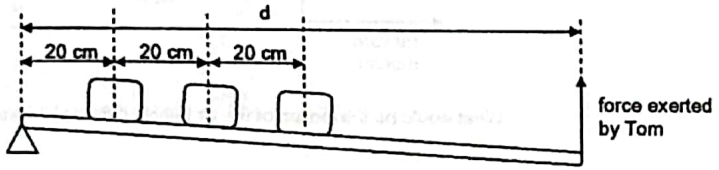
11 Tom sits on a chair and Gina tries to tilt the chair by exerting a force as shown in the diagram.



Given that the weights of the chair and Tom are 30 N and 600 N respectively, and that they act at a distance midway between the front and back legs of the chair, determine the minimum force required by Gina to tilt the chair.

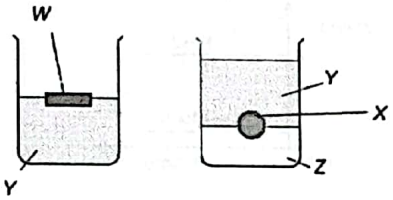
A 126 N B 252 N
C 504 N D 630 N

12 Three boxes, each of weight 500 N, are placed on a plank of negligible mass as shown in the diagram. Tom intends to lift the three boxes up by exerting a force at the other end of the plank. If Tom is only capable of exerting a maximum force of 500 N, determine the length of the plank d required before he is just able to lift the boxes.



A 60 cm
B 80 cm
C 100 cm
D 120 cm

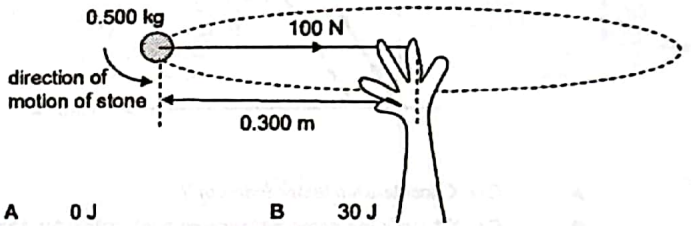
13 A student assembled the set up below as shown in the diagram using two balls made of different materials *W* and *X*, and two different liquids *Y* and *Z*.



Which of the following correctly arranges *W*, *X*, *Y* and *Z* in descending order of their densities?

A *W*, *X*, *Y*, *Z*
B *W*, *Y*, *X*, *Z*
C *Z*, *X*, *Y*, *W*
D *Z*, *Y*, *X*, *W*

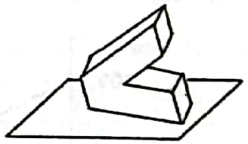
14 A 0.500 kg stone tied to a 0.300 m long string is twirled in a horizontal circle as shown in the diagram. The only horizontal force acting on the stone is the 100 N tension by the string. Calculate the work done by this tension. Assume that there is negligible air resistance.

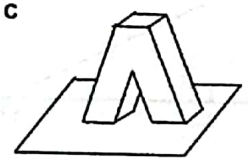


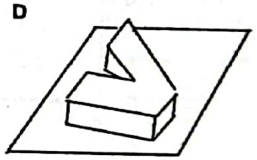
A 0 J
B 30 J
C 50 J
D 188 J

15 The diagram below show a V-shaped object placed in different orientation. In which position does the object exert the maximum pressure on the surface it is resting?

A


B


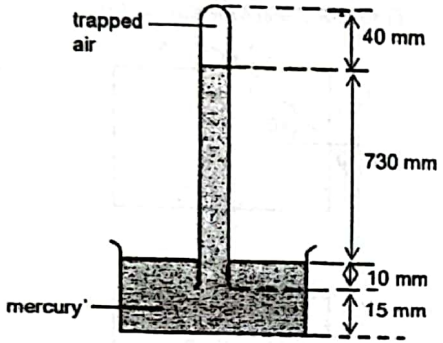
C


D


16 On a cloudy day, a sealed packet of potato chips is taken to the top of a mountain. The packet is found to blow up like a balloon. This could be because _____.

A the air outside the packet is now hotter than the air inside the packet
B the air outside is now at a lower pressure than the air inside the packet
C the ultraviolet radiation has increased
D the packet has a small hole which allowed air to leak in

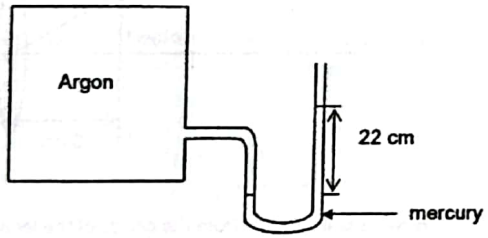
17 The diagram shows a simple mercury barometer with trapped air. The atmospheric pressure is 760 mmHg.



What is the pressure exerted by the air trapped above the mercury column?

A 30 mm Hg
B 40 mm Hg
C 730 mm Hg
D 740 mm Hg

18 The diagram shows a manometer connected to a container of argon gas. If the atmospheric pressure is 76 cm Hg, what is the pressure exerted by the argon?



A 22 cm Hg
B 54 cm Hg
C 76 cm Hg
D 98 cm Hg

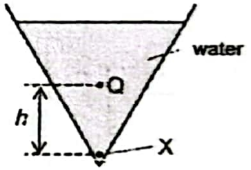
19 The resistance of a piece of platinum wire in pure melting ice is 800 Ω and the resistance of the wire in steam is 910 Ω. What would be the temperature when the wire has a resistance of 1000 Ω?

A 55°C
B 110°C
C 182°C
D 222°C

20 When some gases are heated in a sealed container, which of the following does not increase?

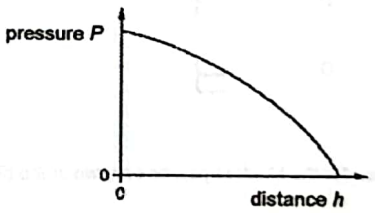
A The average speed of the gas molecules.
B The average kinetic energy of the gas molecules.
C The average distance between the gas molecules.
D The number of collisions by the gas molecules on the walls of the container per unit time.

21 The diagram shows a conical vessel full of water and the pressure at point X due to the water is *P*.

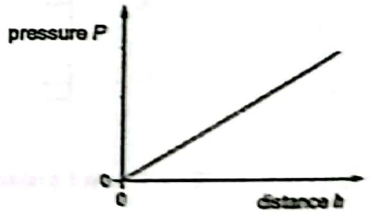


If point Q is a distance *h* above point X, which graph shows how the pressure *P* due to the water at Q varies with distance *h*?

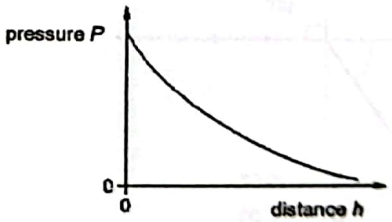
A



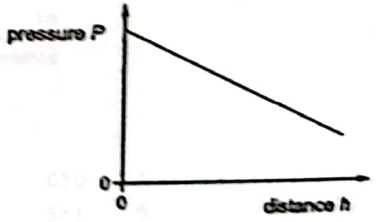
B



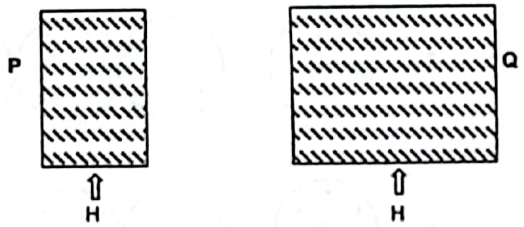
C



D



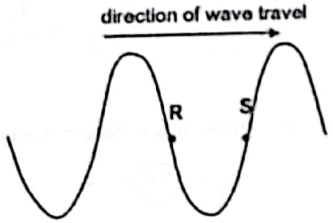
22 The diagram shows two blocks of copper, P and Q. The mass of P is half the mass of Q. The temperature rise of Q is half the temperature rise of P when the same amount of heat, H is supplied to each block.



Which statement correctly explains the observation?

A The heat capacity of P is half the heat capacity of Q.
B The heat capacity of P is twice the heat capacity of Q.
C The specific heat capacity of P is half the specific heat capacity of Q.
D The specific heat capacity of P is twice the specific heat capacity of Q.

23 A transverse wave travels steadily from left to right as shown below.



Which of the following concerning the directions of the movement of the particles R and S is true?

	R	S
A	To the right	To the left
B	To the left	To the right
C	Upwards	Downwards
D	Downwards	Upwards

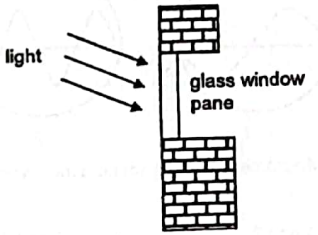
24 An exploding star gives out energy in the form of waves. The waves travel to Earth through space. Which of these waves could not be received from the star?

A Infra red waves
B Light waves
C Radio waves
D Sound waves

25 Which of the list shows visible light, ultraviolet rays and infrared rays correctly arranged in the order of increasing frequency?

	Lowest frequency →		Highest frequency
A	visible light	ultraviolet rays	infrared rays
B	ultraviolet rays	visible light	infrared rays
C	infrared rays	visible light	ultraviolet rays
D	infrared rays	ultraviolet rays	visible light

26 Which of the following does not change as light passes into the glass window pane?

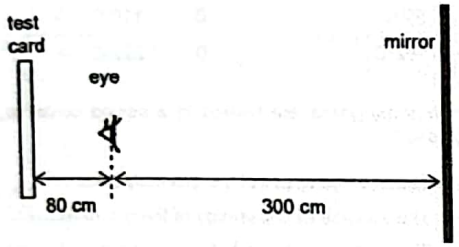


A velocity
B wavelength
C frequency
D direction

27 Which statement about the evaporation of a liquid is not correct?

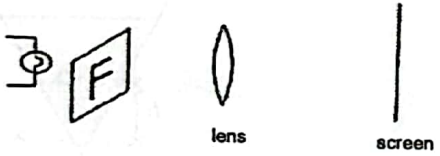
A The average kinetic energy of the molecules in the liquid decreases.
B Evaporation takes place at the liquid's surface.
C The surface area of the liquid affects the rate of evaporation.
D Less energetic molecules escape from the liquid causing the temperature of the liquid to decrease.

28 The diagram shows a plane mirror placed at distance of 300 cm in front of the patient. If the optician's test card is fixed at 80 cm behind the eyes of the patient, what is the distance from his eyes to the image of the card?



A 380 cm B 300 cm
C 760 cm D 680 cm

29 A transparent sheet with a letter "F" is projected through a convex lens on a translucent screen to give a magnified image as shown in the diagram.

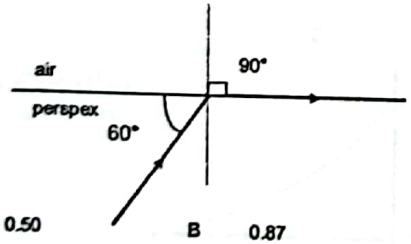


The image observed on the screen will be

A  B 

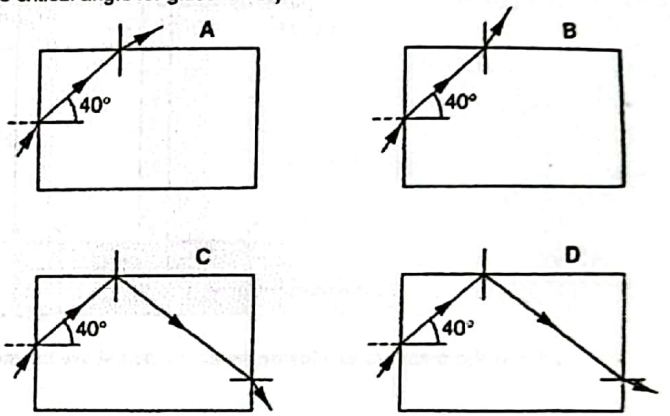
C  D 

30 What is the refractive index for the block of perspex shown in the diagram?

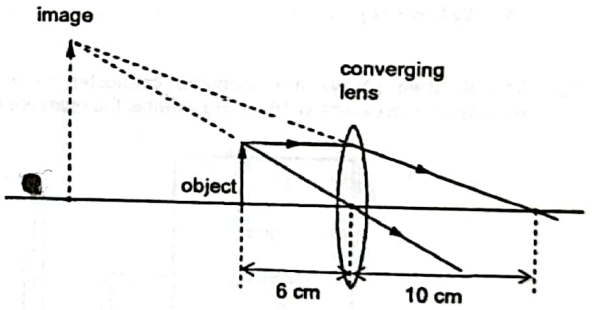


A 0.50 B 0.87
C 1.15 D 2.00

31 A ray of light is incident on one side of a rectangular glass block, such that the angle of refraction is 40° in the glass. Which diagram correctly shows a possible path of this ray? (The critical angle for glass is 42°)



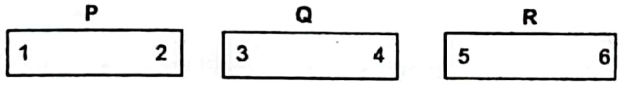
32 The diagram shows a converging lens used as a magnifying glass when the object is at 6 cm from the centre of the lens.



How far is the image from the centre of the lens when the object is now placed 20 cm away from the lens?

A 20 cm B 18 cm
C 12 cm D 10 cm

38 Three metal bars **P**, **Q**, and **R** are identical in size and shape, they are suspected of being magnets. Tests are carried out and it is found that there is attraction between poles 1 and 6, between poles 2 and 4, and between poles 2 and 6. However poles 2 and 3, there is repulsion.



Without making any further tests, which statement is correct?

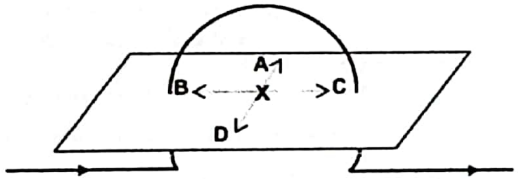
A P and Q are magnets.

B P and R are magnets.

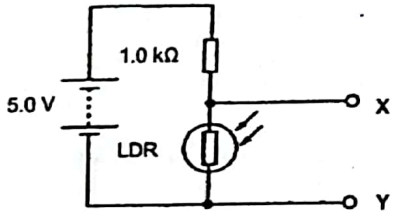
C Poles 2 and 5 would repel one another.

D All three metal bars are magnets.

39 A compass is placed at point **X** on the cardboard as shown in the diagram. Which direction does the north pole of the compass needle point towards?



40 A potential divider circuit based on a light-dependent resistor (LDR) is shown in the diagram below. The supply **XY** has negligible resistance.



At a particular light intensity, the resistance of the LDR is 250 Ω. What is the potential difference across the LDR?

A 1.0 V **B** 1.5 V

C 2.0 V **D** 2.5 V

End of Paper

ZHENGHUA SECONDARY SCHOOL
Secondary 4 Express
Pure(Physics)
Preliminary Examinations 2023

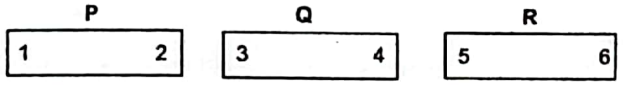
6091/01

August 2023

Marking Scheme

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

38 Three metal bars **P**, **Q**, and **R** are identical in size and shape, they are suspected of being magnets. Tests are carried out and it is found that there is attraction between poles 1 and 6, between poles 2 and 4, and between poles 2 and 6. However poles 2 and 3, there is repulsion.



Without making any further tests, which statement is correct?

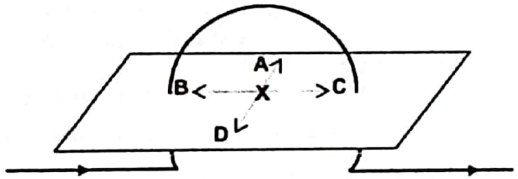
A P and Q are magnets.

B P and R are magnets.

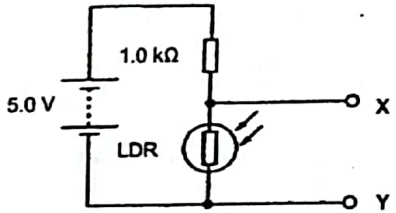
C Poles 2 and 5 would repel one another.

D All three metal bars are magnets.

39 A compass is placed at point **X** on the cardboard as shown in the diagram. Which direction does the north pole of the compass needle point towards?



40 A potential divider circuit based on a light-dependent resistor (LDR) is shown in the diagram below. The supply **XY** has negligible resistance.



At a particular light intensity, the resistance of the LDR is 250 Ω. What is the potential difference across the LDR?

A 1.0 V **B** 1.5 V

C 2.0 V **D** 2.5 V

End of Paper

ZHENGHUA SECONDARY SCHOOL
Secondary 4 Express
Pure(Physics)
Preliminary Examinations 2023

6091/01

August 2023

Marking Scheme

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

Name: | Class | Index Number

Jurong West Secondary School
Preliminary Examinations 2023

40

PHYSICS 6091/01

Paper 1 Monday, 14 August 2023

Secondary Four Express 0800 - 0900

1 hour

Candidates answer on the Multiple Choice Answer Sheet.

Additional Materials: Multiple Choice Answer Sheet

READ THESE INSTRUCTIONS FIRST

Write your name, class and index number on all the work you hand in.
Write in soft pencil.
You may use an HB pencil for any diagrams, graphs, tables or rough working.
Do not use staples, paper clips, glue or correction fluid.

The use of an approved scientific calculator is expected, where appropriate.
You may lose marks if you do not show your working or if you do not use appropriate units.

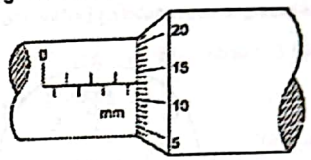
There are forty questions on this paper. Answer all questions. For each question there are four possible answers A, B, C and D. Choose the one you consider correct and record your choice in soft pencil on the separate Answer Sheet. **Read the instructions on the Answer Sheet very carefully.** Each correct answer will score one mark. A mark will not be deducted for a wrong answer. Any rough working should be done in this question paper.

After checking of answer script		
Checked by Student	Signature	Date

This document consists of 18 printed pages including cover page.

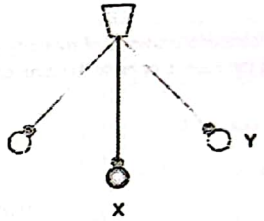
Setter : Mr Lim YT

1 What is the reading shown on the micrometer?



A 3.13 mm B 3.63 mm C 7.13 mm D 7.63 mm

2 The time taken for a pendulum to swing from the rest position X to Y and from Y back to X is 2.0 s.

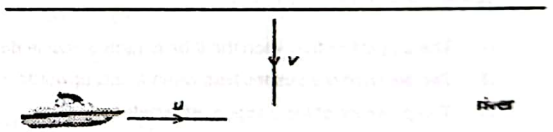


What is the period of the pendulum if a pendulum with longer length is used?

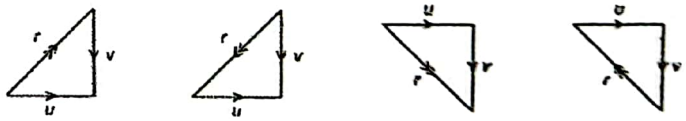
A 2.0 s B 3.0 s C 4.0 s D 5.0 s

3 A boat starts moving across a river at velocity v perpendicular to the riverbank. The boat encounters a current along the river of velocity u, as shown.

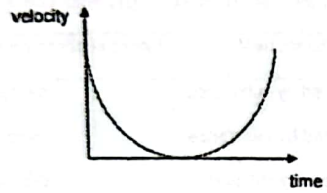
Which diagram shows the resultant velocity r, of the boat?



A B C D

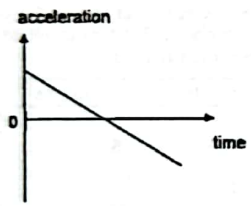


4 The graph shows the variation with time of the velocity of an object.

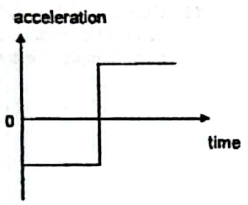


Which graphs shows the variation with time t of the acceleration a of the object?

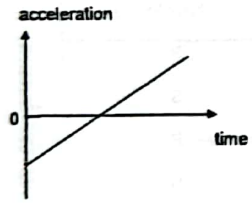
A



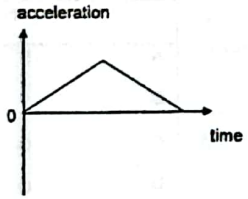
B



C



D

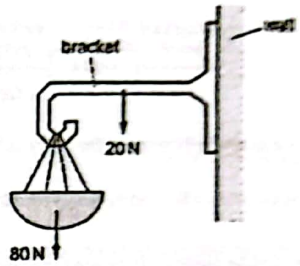


5 A man pulls a cart of mass 25 kg across level ground with a horizontal force of 60 N. A constant force of friction of 20 N acts on the cart.

What is the acceleration of the cart?

A 0.63 m/s² B 1.6 m/s² C 2.4 m/s² D 3.2 m/s²

6 A hanging basket is fixed to a wall by a socket.



The weight of the basket is 80 N. The weight of the bracket is 20 N.

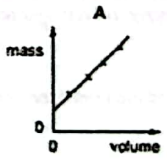
What is the size and direction of the force exerted on the bracket by the wall?

	size of force	direction of force
A	20 N	downwards
B	100 N	upwards
C	20 N	upwards
D	100 N	downwards

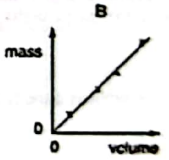
7 Some students measure the masses and volumes of different sized samples of a type of wood.

Which graph shows their results?

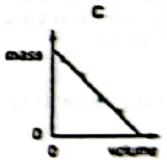
A



B

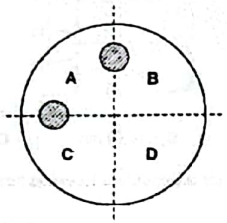


C

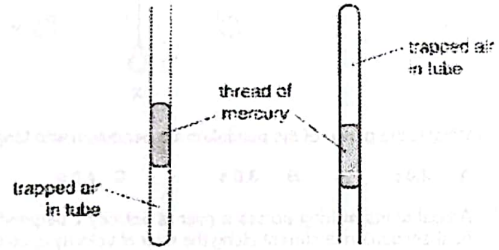


D

8 The diagram shows a uniform lamina with two shaded portions cut out. In which section will the centre of gravity of the remaining portion most likely be located?



9 A thin tube contains a thread of mercury which traps air at the end of the tube. The other end of the tube is open to the atmosphere.

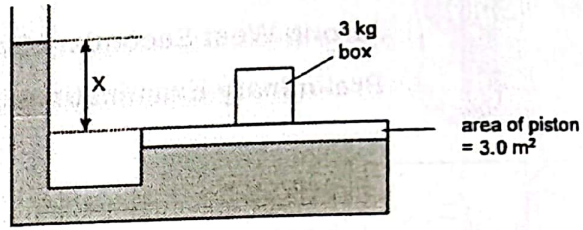


When the tube is turned upside down, the volume of trapped air increases.

Which statement explains this?

A The air gets hotter when the tube is turned upside down.
B The atmosphere pushes less when it acts upwards on the mercury.
C The pressure of the trapped air is reduced.
D The trapped air molecules hit the mercury harder when travelling downwards.

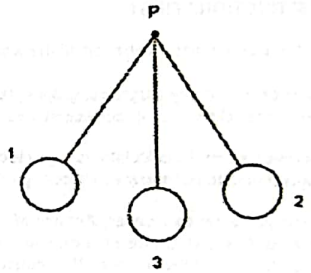
10 A 3 kg box is resting on a piston platform that has an area of 3.0 m².



Given that the liquid inside the container has a density of 800 kg/m³, what is the height of X?

A 0.0125 mm B 0.00125 mm C 1.25 mm D 12.5 mm

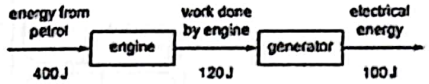
11 A mass hangs from a fixed-point P. It starts from position 1 and swings to position 2 which is the furthest position on the opposite side. It then oscillates several times with decreasing amplitude until it comes to rest at position 3.



Where does the mass have the most kinetic energy?

A at position 1
B at position 2
C the first time at position 3
D the last time at position 3

12 Energy from petrol is used to operate an engine. The engine drives a generator, which produces electrical energy.



What is the overall efficiency of the process?

A 25 % B 30 % C 55 % D 83 %

13 When the smoke particles in air are observed with a microscope, moving points of light are seen.

Which of the following statements best describes the points of light?

A The points of light come from the smoke particles and show the random motion of the air particles.

B The points of light come from the smoke particles and show the random motion of the smoke particles.

C The points of light come from the air particles and show the random motion of the air particles.

D The points of light come from the air and smoke particles and show the random motion of the air particles.

14 Each box shows identical molecules of a gas represented by circles with arrows to show the direction of travel and the speed of the molecule. A longer arrow represents a higher speed.

Which box contains a gas of the highest density and the lowest temperature?

A B C D

15 Which row shows what happens to the latent heat and forces of attraction between molecules when a substance changes from a random to fixed arrangement?

	latent heat	forces of attraction between molecules
A	absorbed by substance	decreases
B	absorbed by substance	increases
C	given out by substance	decreases
D	given out by substance	increases

16 Samples of four different substances are heated in turn by the same heater, for the same time duration and in the same conditions. The time taken for the temperature for each sample to increase by 5 °C is recorded in a table.

sample	time for 5 °C rise / s
P	10
Q	5
R	800
S	1200

Which materials should be used to make the body and handle of a frying pan?

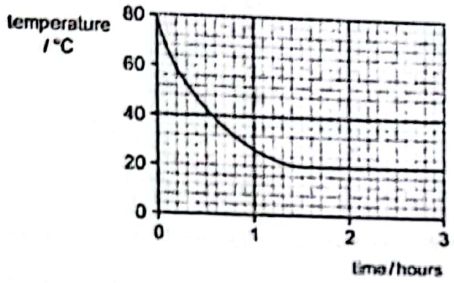
	body	handle
A	P	R
B	P	S
C	Q	R
D	Q	S

17 A boy measures the pressure of a gas at the ice and steam point. At ice point, the pressure of the gas is 120 kPa and at steam point, the pressure of the gas is 260 kPa. The pressure of the gas varies linearly with temperature.

What is the temperature of the gas when the pressure of the gas is 85 kPa?

A -33 °C B -25 °C C 25 °C D 33 °C

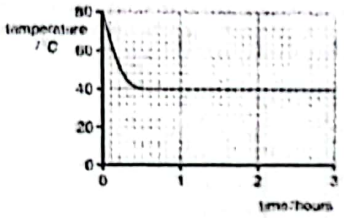
18 The diagram shows the temperature-time graph for hot water that is cooling in an uninsulated beaker.



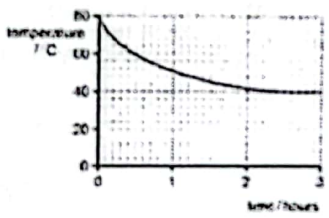
The beaker is now insulated. The same volume of hot water, at the same initial temperature as before, is put into the insulated beaker. The beaker is in the same room as before.

Which is the new temperature-time graph for the water as it cools?

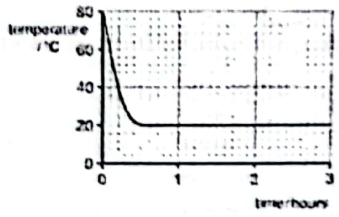
A



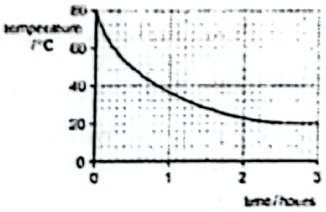
B



C



D



19 A 2 kW kettle containing boiling water is placed on a balance. The kettle is left on and the water continues to boil. The balance reading changes by 0.20 kg after some time.

The specific latent heat of vaporisation of water is 3 000 000 J / kg.

How long did the water boil for?

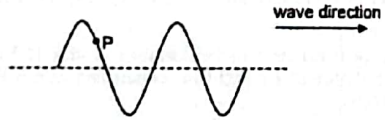
A 0.0033 s B 300 s C 300 000 s D 1 200 000 s

20 When a liquid evaporates, some molecules escape.

What is the effect on the average kinetic energy of the liquid molecules and from where do the molecules escape?

	kinetic energy of liquid molecules	molecules escape from
A	decreases	everywhere within the liquid
B	decreases	the surface only
C	increases	everywhere within the liquid
D	increases	the surface only

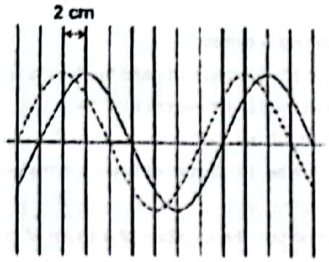
21 The diagram shows a wave on a guitar string with point P marked on the string. The wave is moving in the direction shown.



What is the movement of P?

A downwards then upwards
B to the right
C to the right then to the left
D upwards then downwards

22 A transverse wave at a certain instant is indicated by a solid curve below. After 0.05 s, the wave travelled a distance of 2 cm and is indicated by a dashed curve.



What is the wavelength and frequency of the wave?

	wavelength / cm	frequency / Hz
A	8	2.5
B	8	5
C	16	2.5
D	16	5

23 Which statement correctly describes the image formed by a plane mirror?

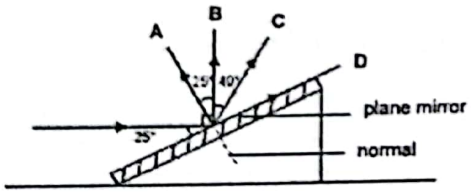
A An image will only be formed when the object is put right in front of a plane mirror.

B The image formed by a plane mirror becomes smaller when the object is moved further away from the mirror.

C The image formed by a plane mirror is real.

D The size of the image formed by a plane mirror is independent of the size of the mirror.

24 The diagram shows a light ray incident on an inclined plane mirror.
Which pathway is taken by the light ray?

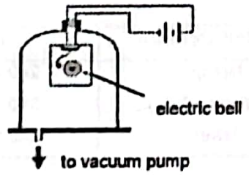


25 At an airport, a passenger's bag is placed in the baggage scanner.

Which type of waves is used to examine the contents in the bag?

A gamma rays B microwaves C ultraviolet rays D X-rays

26 The diagram shows a bell ringing inside an inverted bell jar that is connected to a vacuum pump.



What is likely to happen when the vacuum pump is switched on?

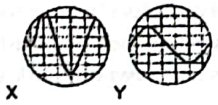
A the bell rings louder

B the bell rings with a higher frequency

C the bell stops ringing

D the ringing of the bell cannot be heard

27 Waveforms of two notes X and Y are shown in the datalogger screens with the same scale.



Which statement is true?

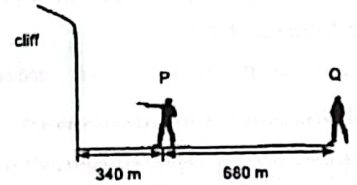
A X has a higher pitch than Y but is not as loud

B X has a higher pitch than Y and is louder

C X has a lower pitch than Y and is not as loud

D X has a lower pitch than Y and is louder

28 Two persons P and Q stand in front of a vertical cliff as shown.
P is holding a pistol.



P fires one shot using the pistol and Q hears two shots instead.
The speed of sound in air is 340 m/s.

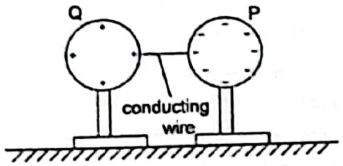
What is the time interval between the two shots that Q hears?

A 1.0 s B 2.0 s C 4.0 s D 8.0 s

29 Which statement best describes an electric field?

A a field that contains electricity
B a field that surrounds a charge particle
C a region in which an electric charge experiences a magnetic force
D a region in which an electric charge experiences an electric force

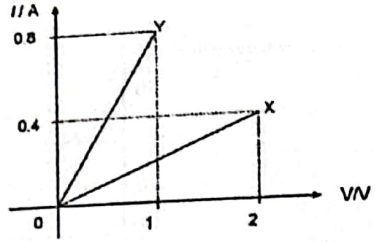
30 Conductor P carries negative charges of -8×10^{-8} C while the conductor Q carries positive charge of 4×10^{-8} C. A conducting wire is then connected between the two conductors.



Which statement describes the flow of charges in the wire?

A 2×10^{-8} C of negative charges will flow from P to Q.
B 2×10^{-8} C of negative charges will flow from Q to P.
C 6×10^{-8} C of negative charges will flow from P to Q.
D 6×10^{-8} C of negative charges will flow from Q to P.

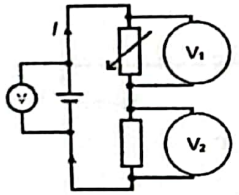
31 The graph shows how current varies with potential difference in wires X and Y which are made up of the same material.



Which set of changes to wire X would allow wire Y to have the same resistance as X?

	length	cross-sectional area
A	doubled	doubled
B	halved	doubled
C	halved	halved
D	no change	doubled

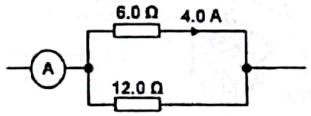
32 In a circuit, a variable resistor is connected with a fixed resistor of constant resistance. V_1 and V_2 represents the potential difference across the variable resistor and fixed resistor respectively. I is the current flowing in the circuit.



Which row correctly describes V_1, V_2 and I when the resistance of the variable resistor increases?

	V_1	V_2	I
A	decrease	increase	decrease
B	decrease	no change	increase
C	increase	decrease	decrease
D	increase	decrease	increase

33 Two resistors of 6.0 Ω and 12 Ω are arranged in parallel as shown.
The current through the 6.0 Ω resistor is 4.0 A.



What current does the ammeter show?

A 4.0 A B 6.0 A C 8.0 A D 12.0 A

34 An electric iron, coffee maker and a lamp are connected in parallel to a single 240 V socket using a three-way adapter. Their electrical ratings are provided in the table.

electrical appliance	rating
laptop	240 V / 100 W
coffee maker	240 V / 650 W
lamp	240 V / 200 W

What is the total current flowing through the socket if all devices are operating at the same time?

A 1.32 A B 3.31 A C 3.96 A D 9.92 A

35 A current of 4 A flows in the live wire of a socket when the appliance is functioning normally.

Which of the following statements is true?

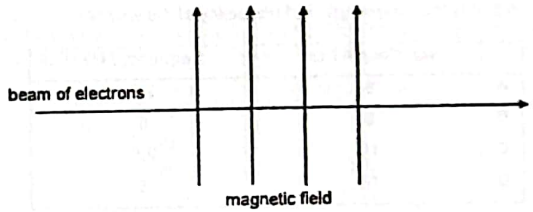
A A current of 4 A flows in the neutral wire.
B A current of 4 A flows in the earth wire.
C A current of less than 4 A flows in the neutral wire.
D A current of less than 4 A flows in the earth wire.

36 The metal case of an electric heater is earthed. The plug to the heater contains a 5 A fuse. There is a current of 4 A when the heater works normally. The live wire becomes loose and makes electrical contact with the metal case.

Which statement is correct?

A The current flows to earth and the fuse is not affected.
B The fuse melts and switches off the circuit.
C The fuse will not melt as the current flowing is below 5 A.
D There will be 4 A of current flowing in the neutral wire.

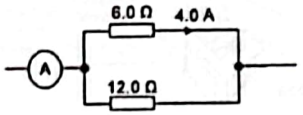
37 The diagram shows the direction of a beam of electrons passing through a magnetic field.



In which direction will the beam of electrons deflect?

A into the page
B out of the page
C up towards the top of the page
D down towards the bottom of the page

33 Two resistors of 6.0 Ω and 12 Ω are arranged in parallel as shown.
The current through the 6.0 Ω resistor is 4.0 A.



What current does the ammeter show?

A 4.0 A B 6.0 A C 8.0 A D 12.0 A

34 An electric iron, coffee maker and a lamp are connected in parallel to a single 240 V socket using a three-way adapter. Their electrical ratings are provided in the table.

electrical appliance	rating
laptop	240 V / 100 W
coffee maker	240 V / 650 W
lamp	240 V / 200 W

What is the total current flowing through the socket if all devices are operating at the same time?

A 1.32 A B 3.31 A C 3.96 A D 9.92 A

35 A current of 4 A flows in the live wire of a socket when the appliance is functioning normally.

Which of the following statements is true?

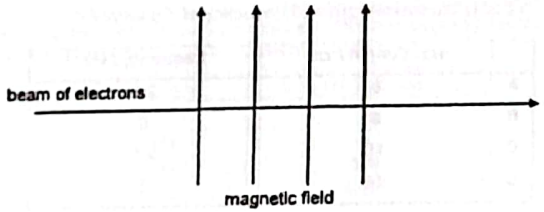
A A current of 4 A flows in the neutral wire.
B A current of 4 A flows in the earth wire.
C A current of less than 4 A flows in the neutral wire.
D A current of less than 4 A flows in the earth wire.

36 The metal case of an electric heater is earthed. The plug to the heater contains a 5 A fuse. There is a current of 4 A when the heater works normally. The live wire becomes loose and makes electrical contact with the metal case.

Which statement is correct?

A The current flows to earth and the fuse is not affected.
B The fuse melts and switches off the circuit.
C The fuse will not melt as the current flowing is below 5 A.
D There will be 4 A of current flowing in the neutral wire.

37 The diagram shows the direction of a beam of electrons passing through a magnetic field.



In which direction will the beam of electrons deflect?

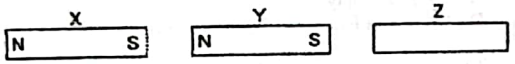
A into the page
B out of the page
C up towards the top of the page
D down towards the bottom of the page

38 P and Q are wires carrying electric currents.
The magnetic field pattern of wire P is shown.

Which of the following shows the correct direction of current in wire P and wire Q, and the effect on both wires?

	direction of current in wire P	direction of current in wire Q	effect on wires
A	into the page	into the page	repulsion
B	into the page	out of the page	repulsion
C	out of the page	into the page	repulsion
D	out of the page	out of the page	attraction

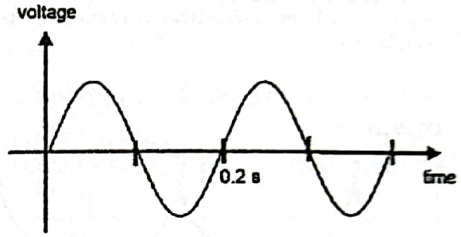
39 The diagram shows three bars placed in a line. X and Y are both magnets. Z is soft iron.



What are the magnetic forces on X and Z due to magnet Y?

	force on X	force on Z
A	attraction	attraction
B	attraction	repulsion
C	repulsion	attraction
D	repulsion	repulsion

40 An ac generator produces an output voltage as shown below.



Which of the following best describes the changes if the generator is turned twice as fast?

	output voltage	period
A	doubled	doubled
B	halved	doubled
C	doubled	halved
D	unchanged	doubled

END OF PAPER

Jurong West Secondary School Solution

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