YUAN CHING SECONDARY SCHOOL
Secondary Four Normal (Academic) Course
Preliminary Examination 2022

CANDIDATE NAME			
CLASS		INDEX NUMBER	

SCIENCE (PHYSICS) 5105/01

Paper 1 Multiple Choice **12 Aug 2022**

Additional Materials: Multiple Choice Answer Sheet **Papers 1 and 2: 1 hour 15 minutes**

READ THESE INSTRUCTIONS FIRST

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

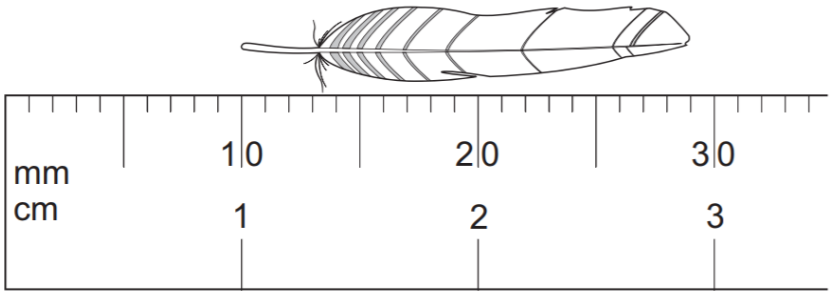
There are **twenty** questions on this paper. Answer **all** questions. For each question there are four possible answers **A**, **B**, **C** and **D**.
Choose the **one** you consider correct and record your choice in **soft pencil** on the separate Answer Sheet.

Read the instructions on the Answer Sheet very carefully.

Answers to Paper 1 and Paper 2 must be handed in separately.
Each correct answer will score one mark. A mark will not be deducted for a wrong answer.
You are advised to spend no more than **30 minutes** on **Paper 1**.
You may proceed to answer Paper 2 as soon as you have completed Paper 1.
Any rough working should be done in this booklet.
The use of an approved scientific calculator is expected, where appropriate.

The total number of marks for Paper 1 is 20.

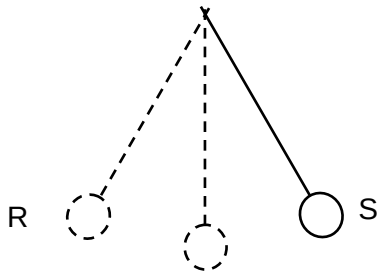
1 The diagram below shows an enlarged drawing of the end of a metre rule.
It is being used to measure the length of a small feather.



What is the length of the feather?

A 19 cm **B** 19 mm **C** 29 cm **D** 29 mm

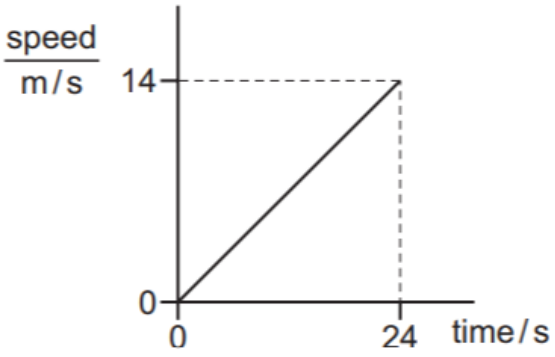
2 The pendulum shown below takes 0.4 s to swing from R to S.



What is the time taken for this pendulum to complete 1 oscillation?

A 0.2 s **B** 0.4 s **C** 0.6 s **D** 0.8 s

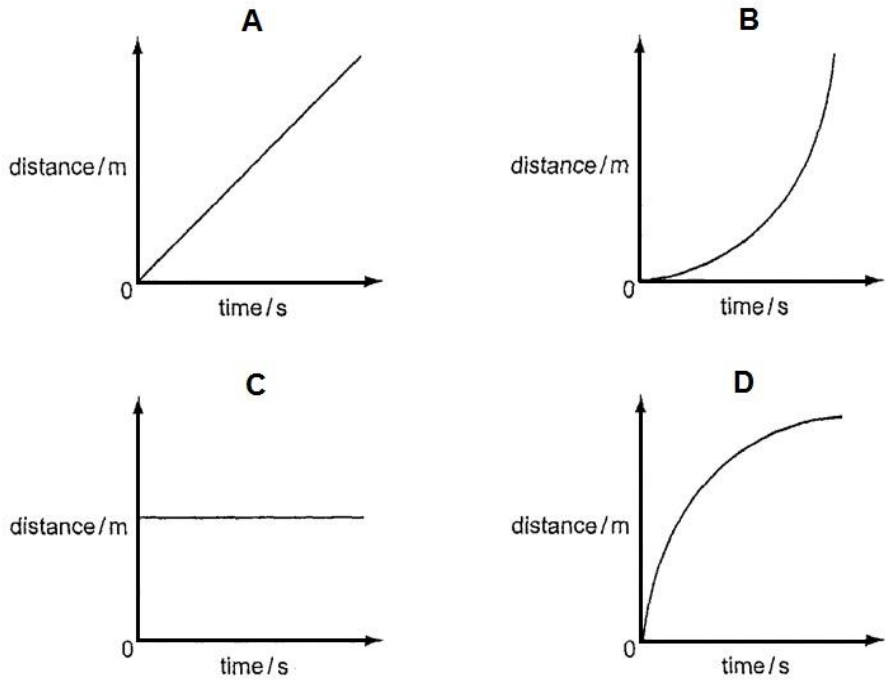
3 The diagram below shows the speed-time graph of a car.



Which of the following statements correctly describes the motion?

A The car accelerates at a constant rate.
B The car has come to a stop at the 24 s mark.
C The car has travelled a distance of 336 m.
D The car is travelling at constant speed.

4 Which of the following graphs shows the car moving at constant speed?



5 The box below is initially at rest. Three forces then act on it as shown.

Which of the following statements about the box is correct?

A The box moves to the left.
B The box moves to the right.
C The box remains stationary.
D The box will move at constant speed.

6 The table below shows information about four objects.

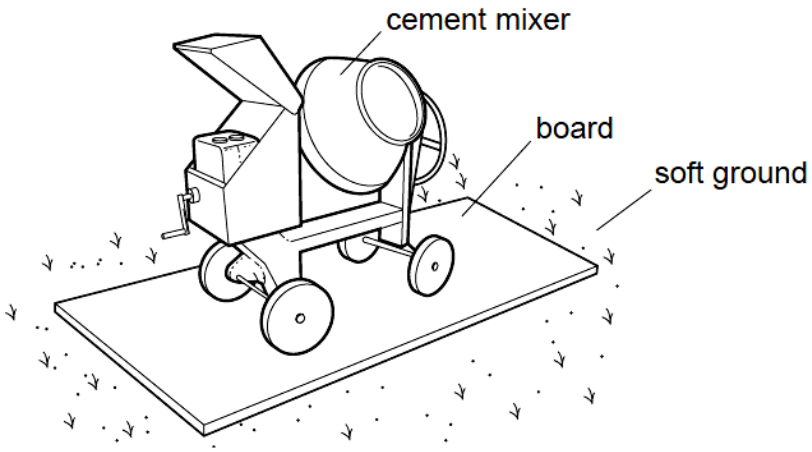
object	mass / g	volume / cm^3
W	9	10
X	11	10
Y	11	12
Z	13	12

The density of water is 1 g/cm^3.

Which objects will sink in water?

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

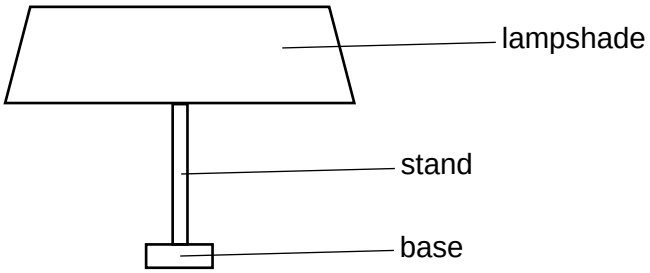
7 To prevent a cement mixer from sinking into soft ground, the mixer is placed on a large flat board as shown in the diagram below.



How does the large flat board prevent the cement mixer from sinking into the soft ground?

A The large area of the board decreases the pressure acting on the ground.
B The large area of the board decreases the weight of the mixer.
C The large area of the board increases the pressure acting on the ground.
D The large area of the board increases the weight of the mixer.

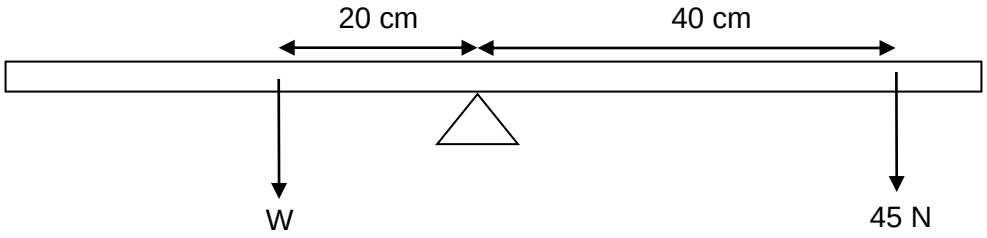
8 The lamp shown below is considered to be poorly designed as it topples easily.



Which of the following changes to the design will improve the stability of the lamp?

A Make the base narrower.
B Make the base wider.
C Make the stand longer.
D Make the stand thicker.

9 A uniform rod is balanced on its mid-point as shown below.



What is the value of W?

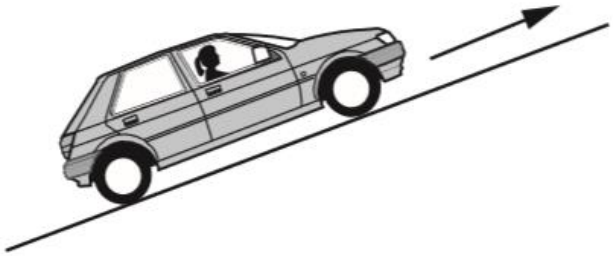
A 15 N **B** 90 N **C** 140 N **D** 200 N

10 A boy and a girl run up the same flight of stairs.
The boy has more mass than the girl.
However, he takes a shorter time than the girl to reach the top of the stairs.

Which of the following statements is correct?

A The boy and the girl do the same amount of work.
B The boy does less work than the girl.
C The boy produces less power than the girl.
D The boy produces more power than the girl.

11 The diagram below shows a car accelerating as it travels uphill.



Which of the following information about the gravitational potential energy and kinetic energy of the car is correct?

	gravitational potential energy	kinetic energy
A	decreasing	decreasing
B	decreasing	increasing
C	increasing	decreasing
D	increasing	increasing

12 A person holds a plastic cup in one hand and fills it quickly with hot water.
It takes several seconds before his hand starts to feel the heat.

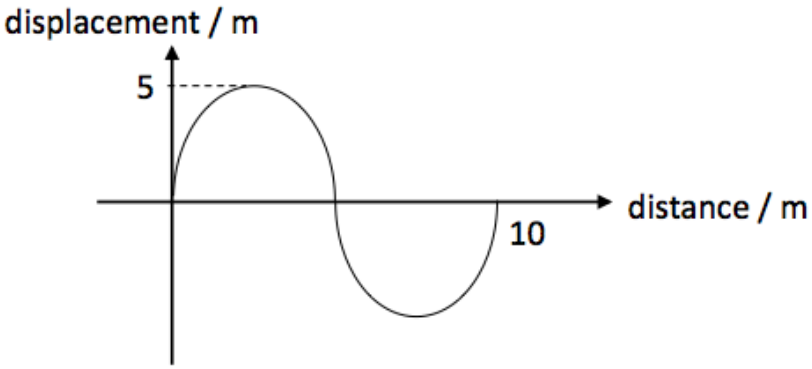
Which of the following statements best explains why it takes so long for the hand to feel the heat?

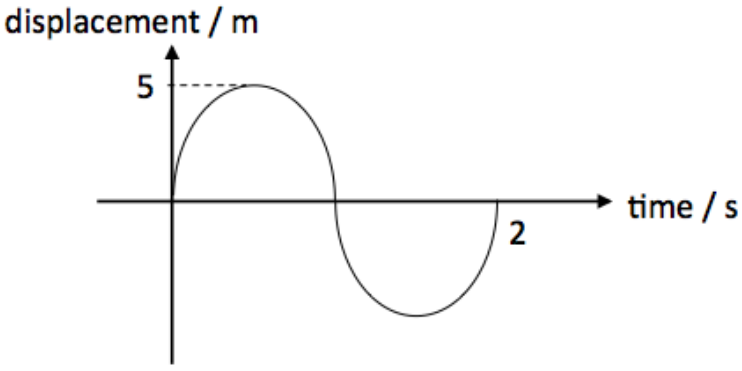
A Plastic is a good conductor of heat.
B Plastic is a good emitter of infrared radiation.
C Plastic is a poor conductor of heat.
D Plastic is a poor reflector of infrared radiation.

13 Which of the following increases when a solid starts to melt due to heating?

A the average potential energy of the molecules
B the average kinetic energy of the molecules
C the size of the molecules
D the temperature of the molecules

14 The graphs below describe the same water wave.

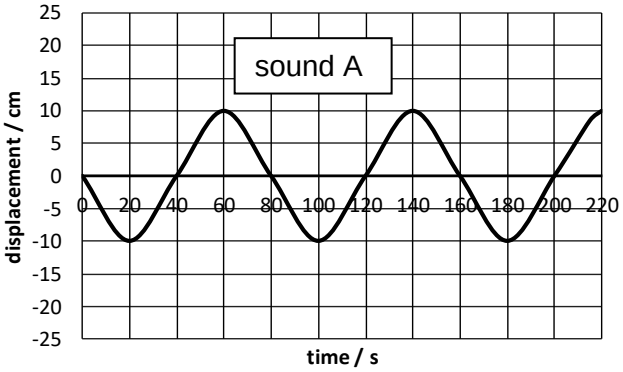


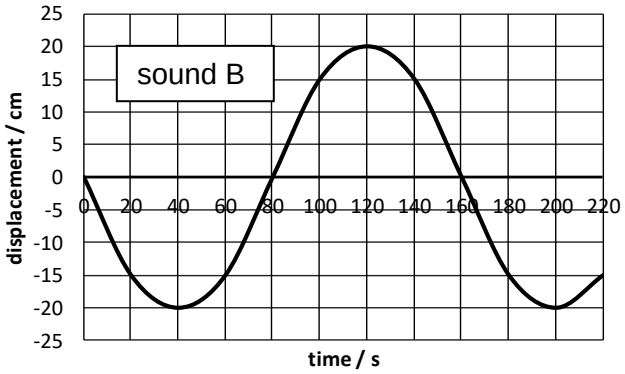


What is the amplitude and frequency of the wave?

	amplitude / m	frequency / Hz
A	5	0.5
B	5	2
C	10	0.5
D	10	2

15 The waveforms of two different sounds, A and B, are shown on an oscilloscope.
The diagrams below show the two waveforms.





Which of the following statements is true?

A Sound A is louder and has a higher pitch than sound B.
B Sound A is louder and has a lower pitch than sound B.
C Sound A is quieter and has a higher pitch than sound B.
D Sound A is quieter and has a lower pitch than sound B.

16 Which type of electromagnetic wave has the longest wavelength?

A gamma ray
B radiowave
C ultra-violet radiation
D X-ray

17 A current of 5 A flows through a conductor in 12 s.

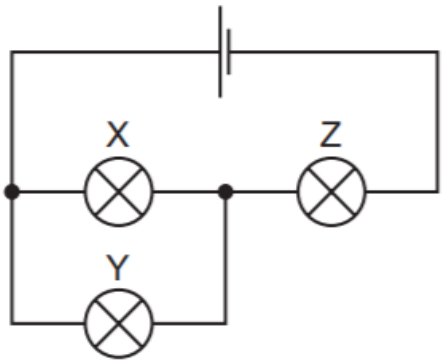
What is the amount of charge in the conductor?

A 0.05 C **B** 0.45 C **C** 2.4 C **D** 60 C

18 Which of the following wires has the lowest resistance?

wire	length / cm	cross sectional area / cm^2
A	3	5
B	3	10
C	9	5
D	9	10

19 The circuit diagram below shows a cell connected to three identical lamps X, Y and Z. All the lamps are lit.

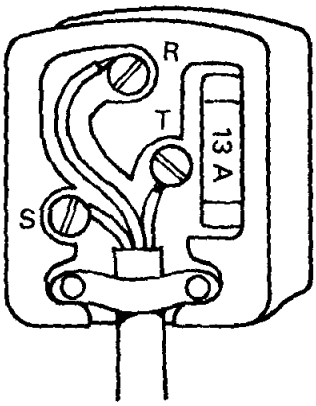


Lamp Y is removed from the circuit.

What happens to lamp Z?

A Lamp Z becomes brighter.
B Lamp Z becomes dimmer.
C Lamp Z does not light up anymore.
D The brightness of Lamp Z stays the same.

20 The diagram below shows a three-pin plug, which is fitted with a 13 A fuse connected to wire T.



What is the name of wire T and the purpose of fitting a fuse?

	name of wire T	purpose
A	earth	direct any current leakage to the ground
B	live	direct any current leakage to the ground
C	live	disconnect the circuit when there is a current surge
D	neutral	disconnect the circuit when there is a current surge

------END OF PAPER------

EFFORTS TODAY, REWARDS TOMORROW

2022 4NA SCI(PHY) P1 PRELIM EXAMINATION MARK SCHEME

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
B	D	A	A	B	C	A	B	B	D
11.	12.	13.	14.	15.	16.	17.	18.	19.	20.
D	C	A	A	C	B	D	B	B	C