Name: _____ Date: _____

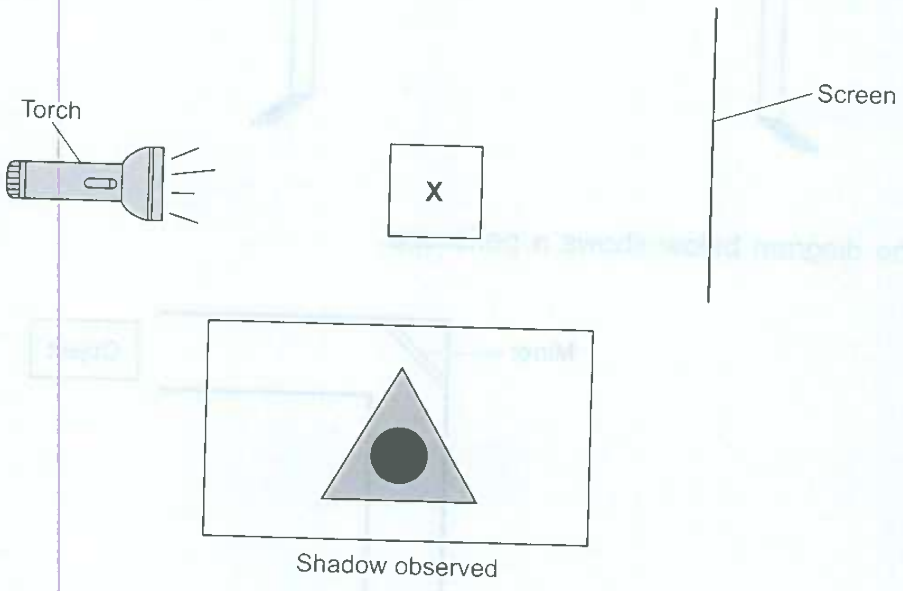
TOPICAL TEST 4C:

30

Section A (10 x 2 marks)

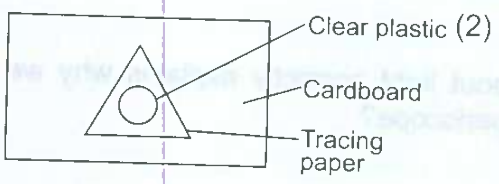
For each question from 1 to 10, four options are given. One of them is the correct answer. Make your choice (1, 2, 3 or 4) and write the answers in the brackets provided.

1. When Object X was placed between a torch and a screen, the following shadow was observed.

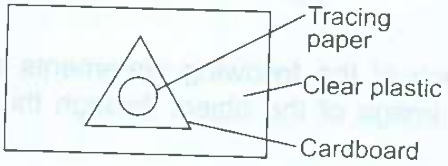


Which of the following could Object X be?

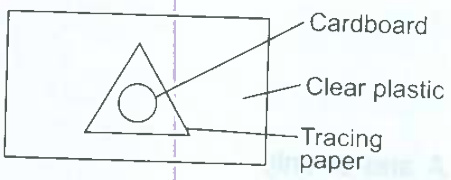
(1)



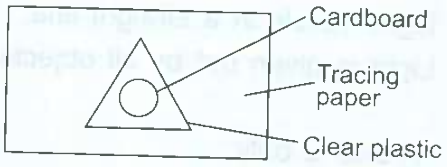
(2)



(3)



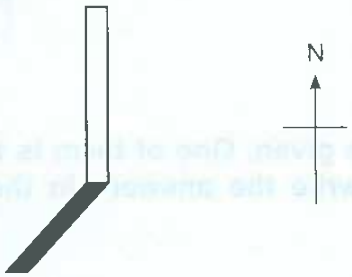
(4)



( )

2. Hui Li recorded the position of the shadow of a pole in a field at 2 p.m. Which of the following shows the shadow that she drew at 2 p.m.?

(1)



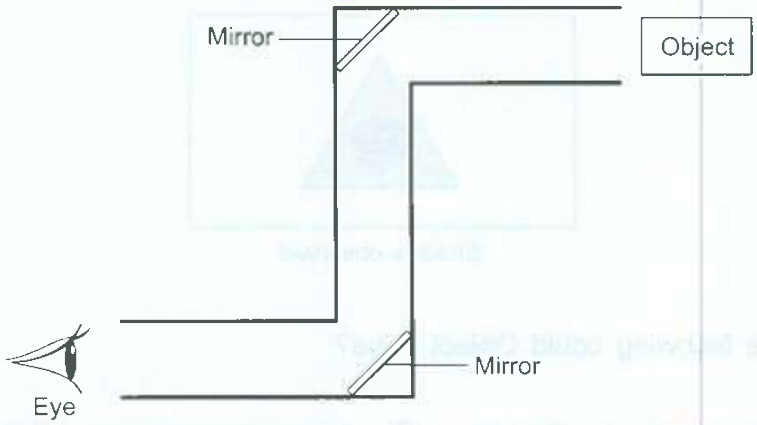
(2)

(3)

(4)

( )

3. The diagram below shows a periscope.



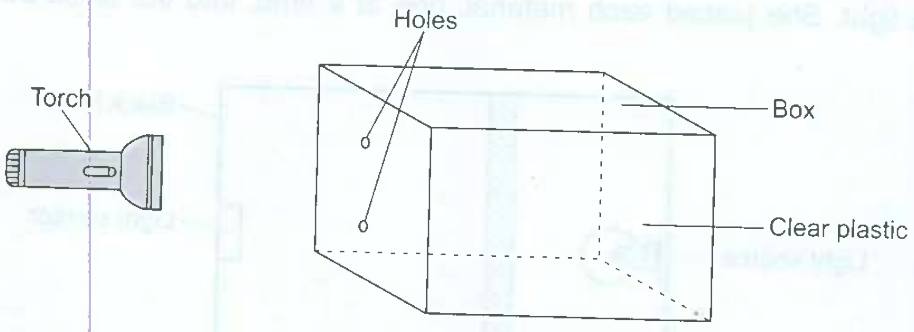
Which of the following statements about light correctly explains why we can see the image of the object through the periscope?

A: Light can bend.
B: Light can be reflected.
C: Light travels in a straight line.
D: Light is given out by all objects.

(1) A and C only
(2) A and D only
(3) B and C only
(4) B and D only

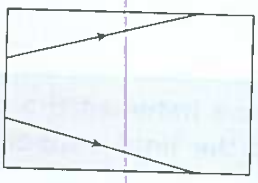
( )

4. Look at the diagram below.

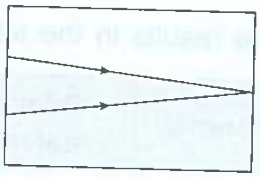


When the torch is switched on, light from the torch enters the box through the two holes. Which of the following correctly shows how the rays of light travel through the box?

(1)

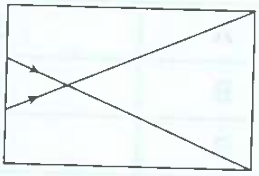


(2)



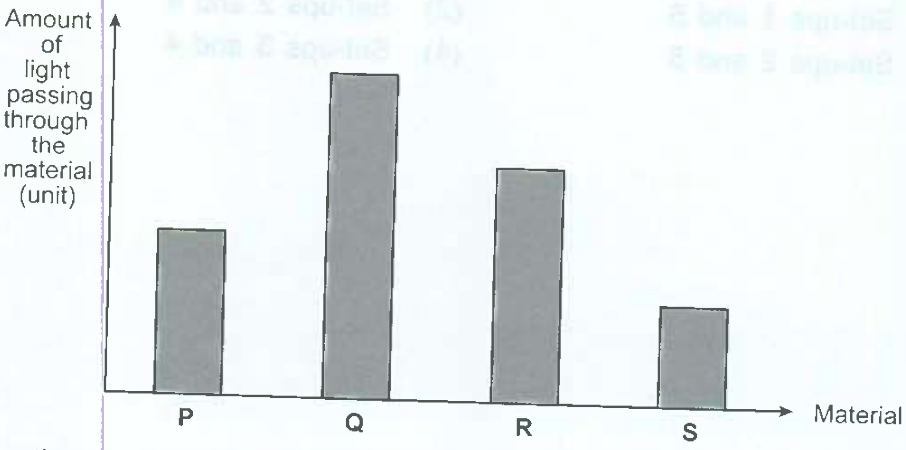
(3)

(4)



( )

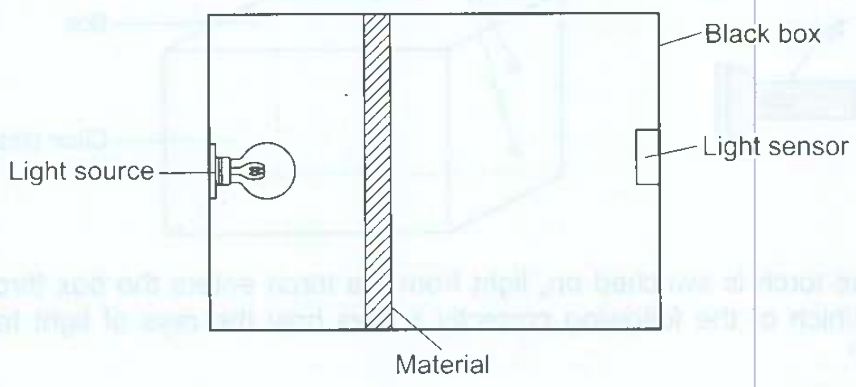
5. Melissa conducted an experiment to measure the amount of light that can pass through four different materials. She used a datalogger and a light sensor to carry out the experiment. The results were recorded in the graph below.



Based on the results above, which of the following statements is true?

(1) Material Q does not allow light to pass through.
(2) Material P casts a lighter shadow than Material Q.
(3) Material S allows the most light to pass through.
(4) Material R allows more light to pass through than Material P. ( )

6. Judy prepared the set-up shown below to find out which material, A or B, blocks more light. She placed each material, one at a time, into the black box.



Judy recorded the results in the table below.

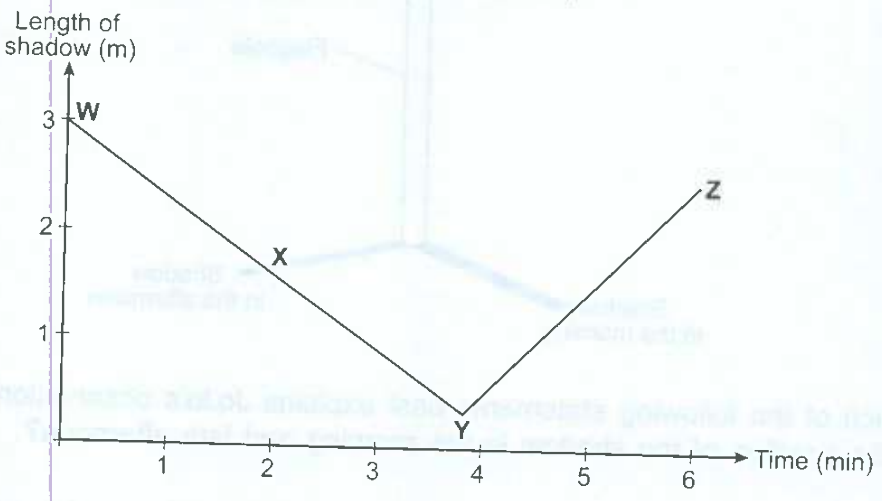
Set-up	Material	Thickness of material (cm)	Distance between the material and the light sensor (cm)
1	A	2	10
2	A	3	15
3	B	2	15
4	B	3	15
5	B	3	10

Which of these set-ups would allow Judy to conduct a fair test?

(1) Set-ups 1 and 5
(2) Set-ups 2 and 4
(3) Set-ups 2 and 5
(4) Set-ups 3 and 4 ( )

7. The line graph below shows how the length of Donna's shadow changed over a period of 6 minutes as she walked in a straight line towards and away from a street lamp at night.

W, X, Y and Z are different points on the line graph.

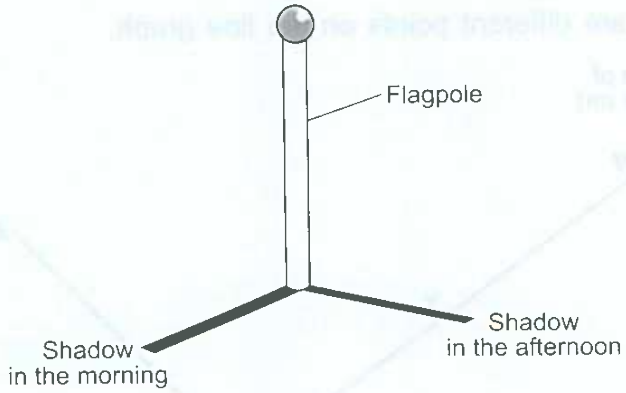


Which parts of the graph shows Donna walking away and walking towards the street lamp?

	Walking away from the street lamp	Walking towards the street lamp
(1)	WX	XY
(2)	XY	YZ
(3)	YZ	WX
(4)	WX	YZ

( )

8. JoJo observed the shadow of a flagpole in the morning and again in the late afternoon. She noticed that the shadow was formed on one side of the flagpole in the morning and on another side in the late afternoon, as shown in the diagram below.

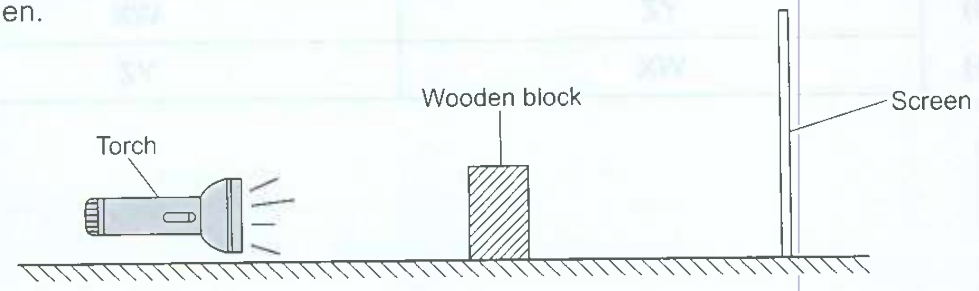


Which of the following statements best explains JoJo's observation of the change in the position of the shadow in the morning and late afternoon?

(1) The position of the shadow changes with the position of the flagpole.
(2) The position of the shadow changes with the position of JoJo.
(3) The position of the shadow changes with the position of the sun.
(4) The position of the shadow changes with the position of the moon.

( )

9. Lydia placed a torch, a wooden block and a screen as shown in the diagram below. She switched on the torch and the shadow of the wooden block was cast on the screen.



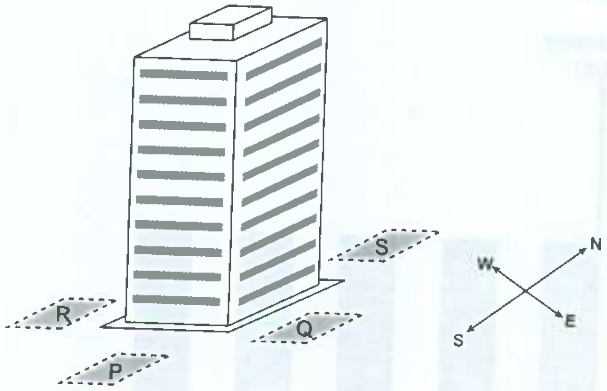
Which of the following changes should Lydia make if she wants the shadow of the wooden block to appear larger?

A: Move the torch nearer to the wooden block.
B: Move the wooden block nearer to the screen.
C: Move the screen further away from the wooden block.

(1) A only
(2) A and C only
(3) B and C only
(4) A, B and C only

( )

10. Andy drove to a building as shown below and reached there at 3 p.m He wanted to find a place to park where his car would be shaded from the afternoon sun.



Which sector of the car park should he park his car at?

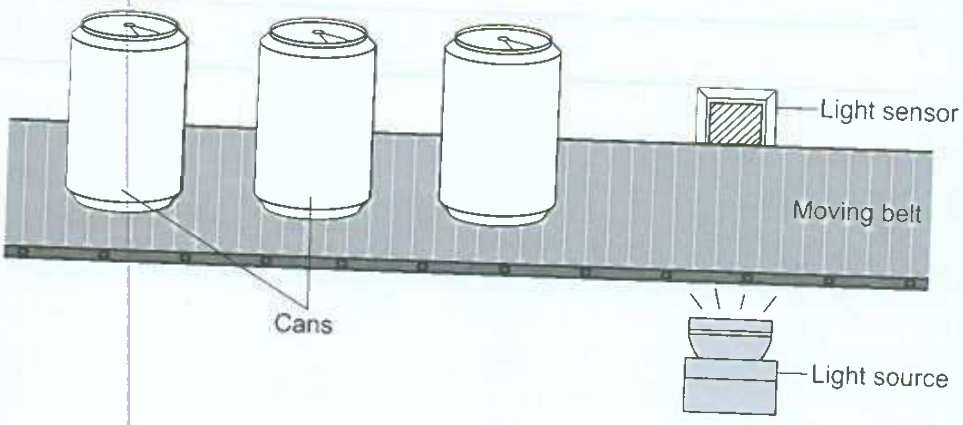
(1) P
(2) Q
(3) R
(4) S

( )

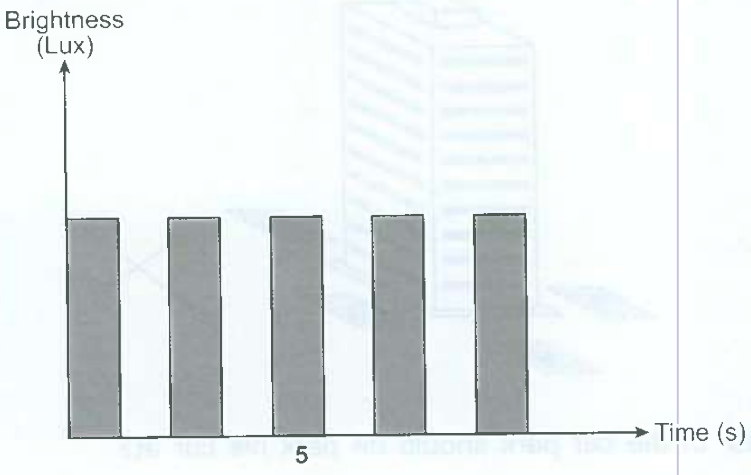
Section B (10 marks)

Read each question carefully and write the answers in the spaces provided.

11. Factory M uses a light sensor to count the number of identical cans on a moving belt.



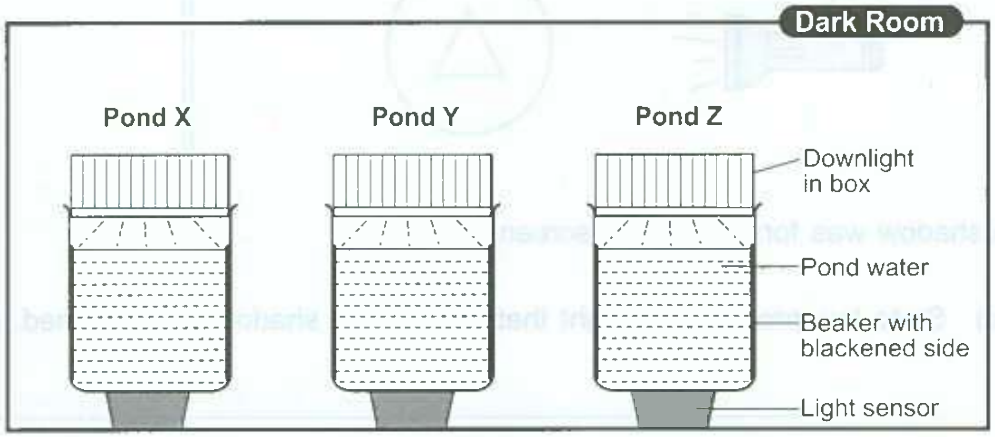
The belt moves at a constant speed. As each can passes between the light source and the sensor, it blocks light from reaching the sensor. The data recorded is shown in the graph below.



(a) Which 2 properties of light does this counting machine work on? (1m)

(b) Without increasing the speed of the moving belt, how can more cans be counted in the same period of time? (1m)

12. Plants need light to grow well. Lily wants to find out which pond provides the best lighting condition for submerged water plants to grow well. She put the same amount of water from three different ponds, one into each beaker, and conducted an experiment with the set-up shown below. The experiment was conducted in a dark room.



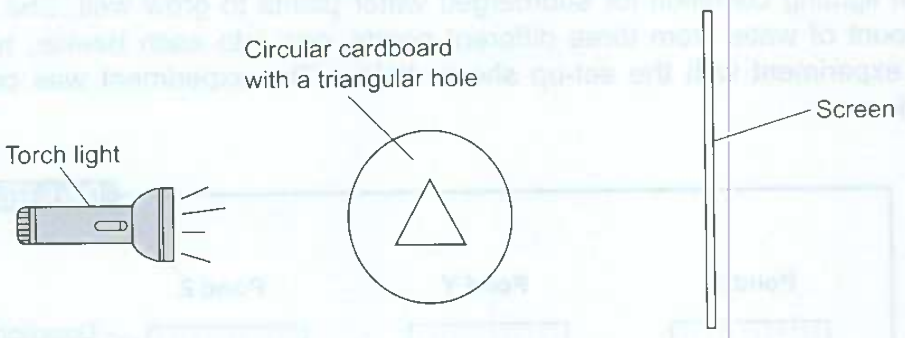
The results were recorded in the table below.

Water sample from	Amount of light detected (Lux)			
	Reading 1	Reading 2	Reading 3	Average
Pond X	120	118	122	120
Pond Y	78	76	77	77
Pond Z	240	242	241	241

(a) In which pond, X, Y or Z, would submerged water plants grow best? Explain your answer. (2m)

(b) Why did Lily repeat the experiment 3 times? (1m)

13. Jake carried out an experiment as shown below.



A shadow was formed on the screen.

(a) State two properties of light that caused the shadow to be formed. (1m)

_____

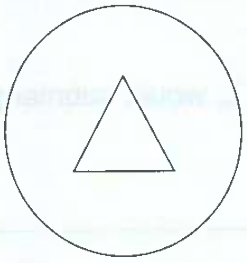
_____

(b) As the card is moved towards the torch light, what changes can be observed about the shadow on the screen? (1m)

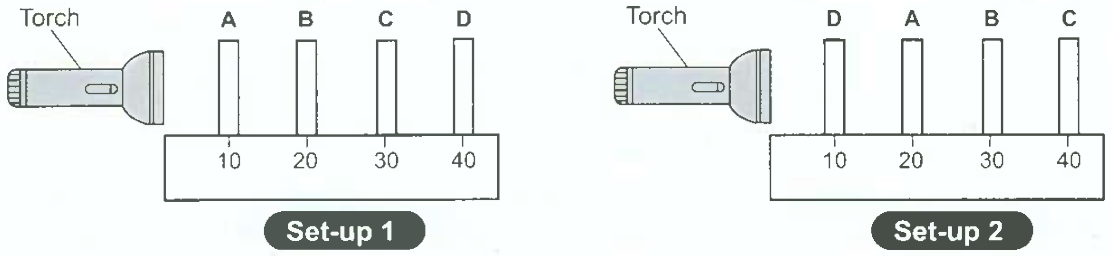
_____

_____

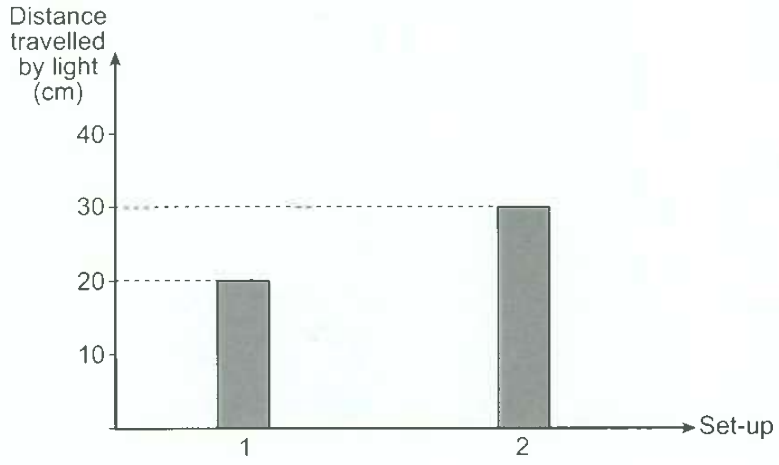
(c) **Shade** the diagram below to show the shadow formed on the screen. (1m)



14. An experiment was conducted to investigate whether light can pass through fours sheets, A, B, C and D, made of different materials. The sheets were arranged in two set-ups as shown below.



The distance travelled by light for each set-up was measured and the results are shown in the graph below.



Indicated the properties of the materials that Sheets A, B, C and D are made of in the table below. Put a tick (✓) in the correct boxes. (2m)

Sheet	Allows light to pass through	Does not allow light to pass through	Not possible to tell
A			
B			
C			
D			