



# OUNDLE

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School

Junior Entrance and Scholarship Examinations 2011

**Science Theory Paper**

**Time allowed: 1 hour**

For this examination you will need a **sheet of graph paper**

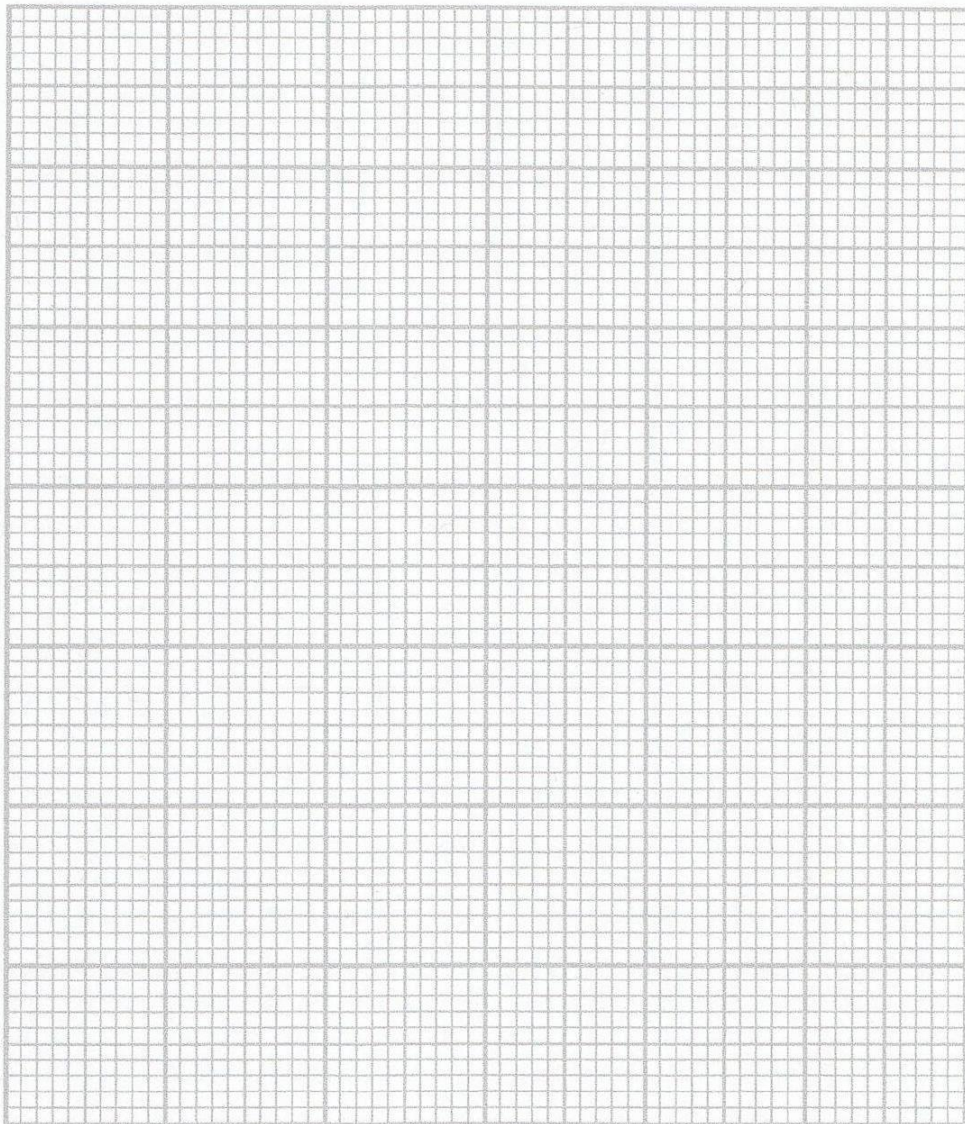
**NAME:**

1.

The table shows the volume of blood flowing through different organs in the body at rest and during exercise.

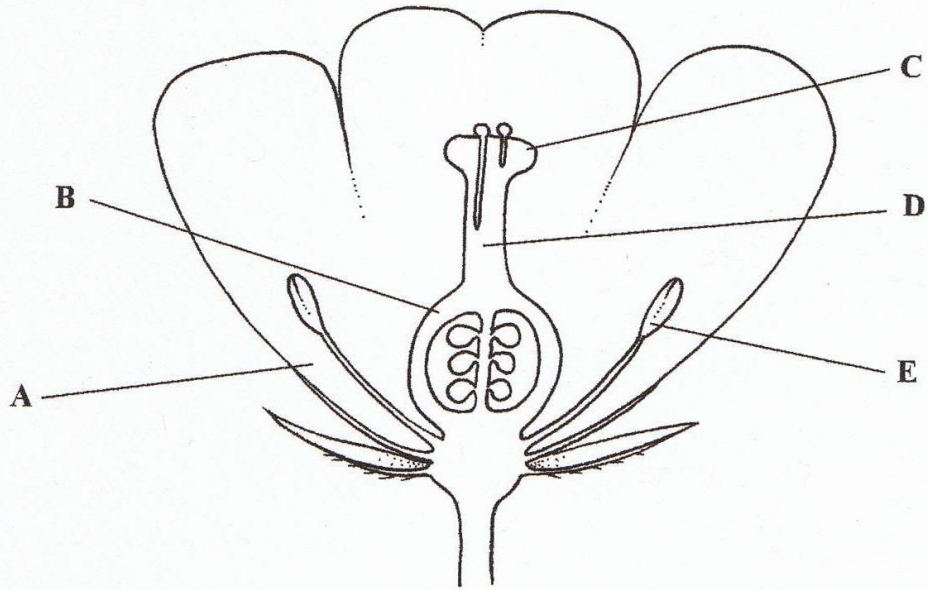
Organ	Volume of blood in cm <sup>3</sup> per minute	
	At rest	During exercise
intestine	1400	600
muscles	1200	12500
skin	500	2000

(a) (i) Use the grid below to draw a bar chart of the information in the table.



2.

The diagram shows a section through a flower.

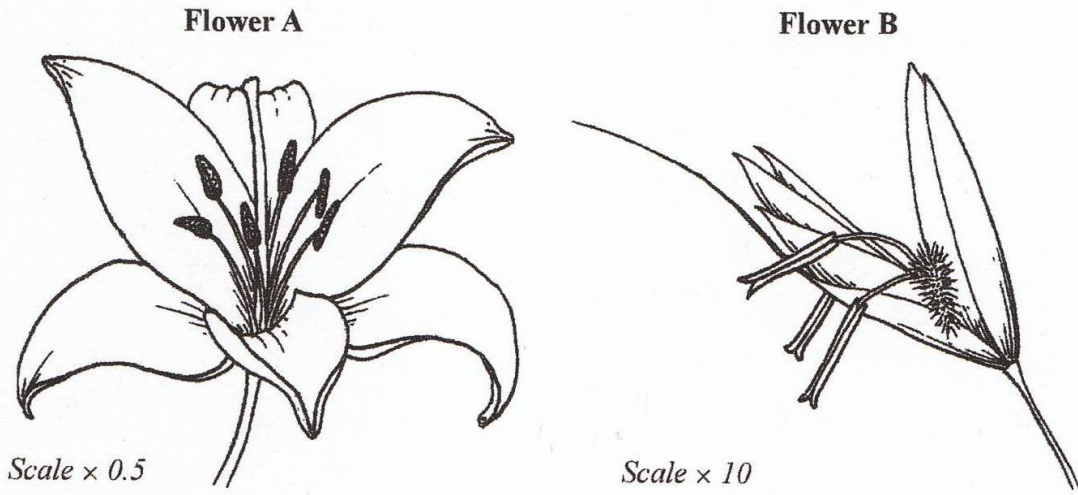


(a) Name the parts labelled A, B, C and D.

- A .....
- B .....
- C .....
- D .....

(4)

The two flowers shown below come from two different species A and B. Flower A is insect-pollinated and flower B is wind-pollinated. One reproduces with the aid of insects; the other uses wind.



(a) Complete the table which compares the structure of the two flowers.

Feature	Flower A	Flower B
position of stamens		
position of stigma		
size of petals		
type of stigma		

(4)

(b) Explain what is meant by the term **insect-pollinated**.

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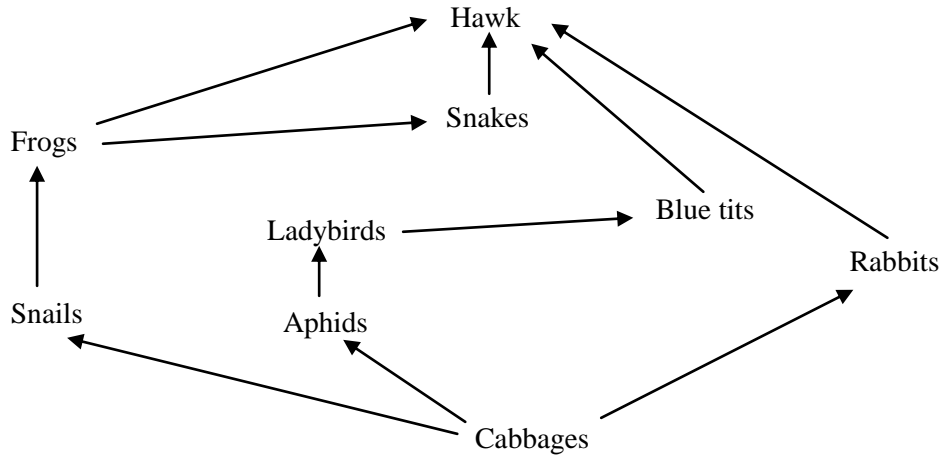
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(2)

3.



(a) What is the source of energy for this food web?

..... [1]

(b) From the food web name,

(i) the producer.

..... [1]

(ii) a primary consumer.

..... [1]

(iii) a secondary consumer.

..... [1]

(c) From the food web draw a food chain containing 5 organisms.

..... [1]

(d) A farmer sprays his cabbages with insecticide to kill the aphids. How will this affect the population of blue tits? Explain your answer.

.....

..... [2]

4. Here is a list of methods of for separating mixtures:

Distillation, Evaporation, Filtration, Chromatography, Fractional distillation, Magnetic behaviour

Which one of these methods would be used to separate the following:

(a) Iron from a mixture of iron and sand \_\_\_\_\_

(b) The different dyes in an ink \_\_\_\_\_

(c) Salt from salt solution \_\_\_\_\_

(d) Petrol from crude oil \_\_\_\_\_

(e) Water from seawater \_\_\_\_\_

(f) Sand from seawater \_\_\_\_\_ [6]

5. When a piece of magnesium is heated strongly in air in a Bunsen flame, a very bright white flame is seen and a white powder is produced.

(a) Magnesium is an element. What is an element?

\_\_\_\_\_  
\_\_\_\_\_ [1]

(b) The white solid is a compound of magnesium and what other element?  
\_\_\_\_\_ [1]

(c) What is the name of this compound?  
\_\_\_\_\_ [1]

(e) The following results were obtained when magnesium is heated with another element called sulphur. When magnesium is heated with sulphur, a violent reaction occurs and magnesium sulphide is formed. The mass of the magnesium used and the mass of the magnesium sulphide was measured.

Mass of magnesium(g)	Mass of magnesium sulphide formed(g)
0.00	0.00
0.05	0.12
0.10	0.23
0.15	0.35
0.20	0.42
0.25	0.58

(i) Plot a line graph on the graph paper provided with the mass of magnesium on the x-axis (horizontal) and the mass of magnesium sulphide on the y-axis (vertical). Draw a best fit straight line as trendline. [3]

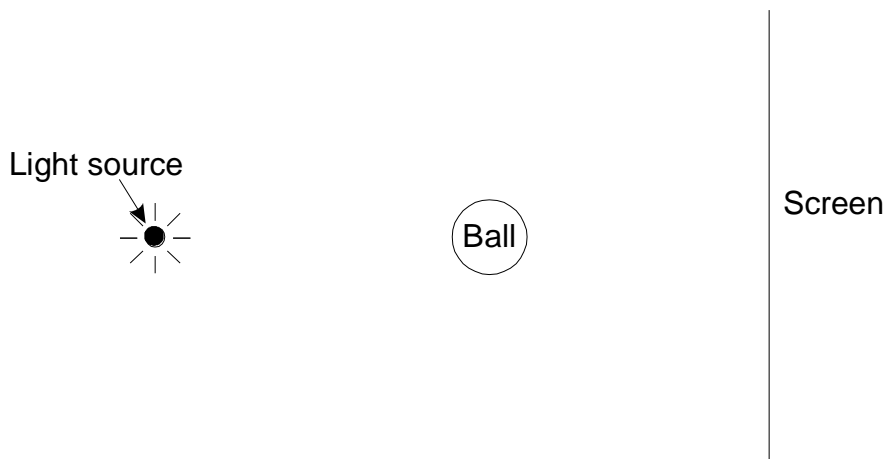
(ii) One of the points does not fit the pattern shown by the others. Which one is it? [1]

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(iii) Use the graph to calculate the mass of magnesium needed to make 0.30g of magnesium sulphide. [1]

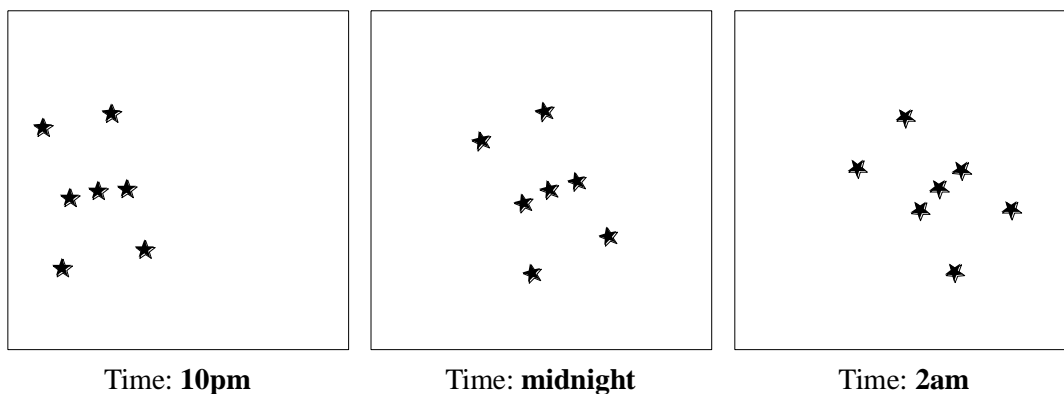
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6. The diagram below shows a point source of light, a ball and a screen.



Draw **two** rays from the light source to show how the shadow of the ball is formed on the screen. (2)

7. (a) A man was facing **south** one night. He was looking up into the sky. The diagrams show the positions of a constellation at **10 pm, midnight** and **2 am**.



Explain why constellations appear to move across the night sky.

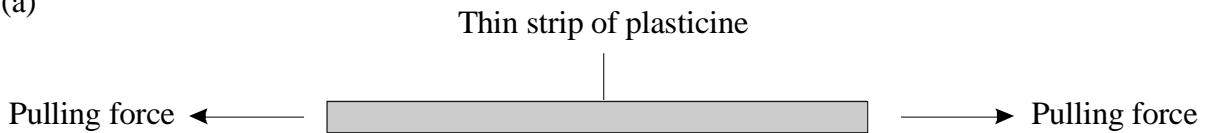
.....  
..... (1)

(b) Describe how planets are different from stars.

.....  
.....  
..... (3)

8. The diagrams show pairs of forces acting on different objects. In each case describe what happens when the forces are increased. Then describe what happens when the forces are removed.

(a)



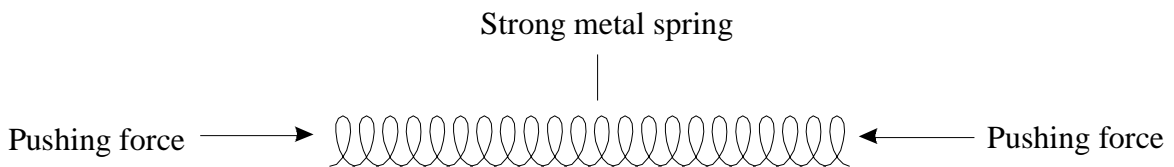
When the forces are increased

.....

When the forces are removed

..... (2)

(b)



When the forces are increased

.....

When the forces are removed

..... (2)