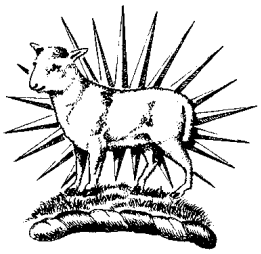
SURNAME _____ **FIRST NAME** _____ **SCHOOL** _____

Merchant Taylors' School



13+ Science Entrance Examination

Specimen Paper

This Paper should be printed in colour

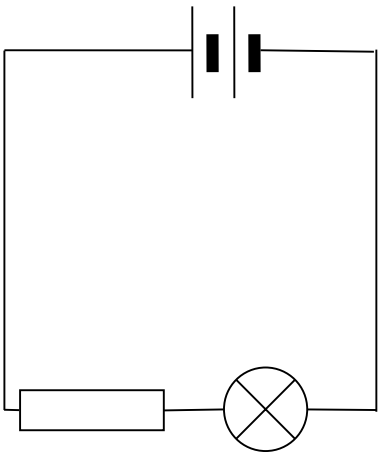
Physics Exam

Time Allowed: 20 minutes Total Marks: 25

Instructions:

1. **The Science paper is divided into three sections (Biology, Chemistry and Physics). The time for the Science paper is 1 hour. You should spend no more than 20 minutes on each section. You will be told when to start the next section.**
2. Write your surname, first name and school at the top of the page.
3. Attempt all the questions.

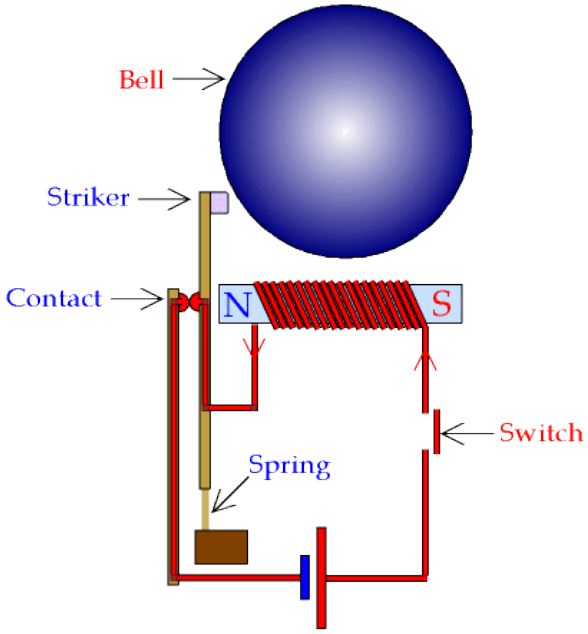
1. ***Redraw*** this circuit diagram in the space provided adding appropriate instruments to measure the current through the lamp and the voltage across the resistor.



Answer:

(3)

2. The diagram shows an electric bell. The striker is made of a magnetic material.



a. Describe and explain what happens when the switch is closed.

……

……

……

……

(3)

b. Why should the metal inside the coil be iron?

……

……

(1)

c. What would happen if the metal inside the coil was steel instead? Explain your answer.

……

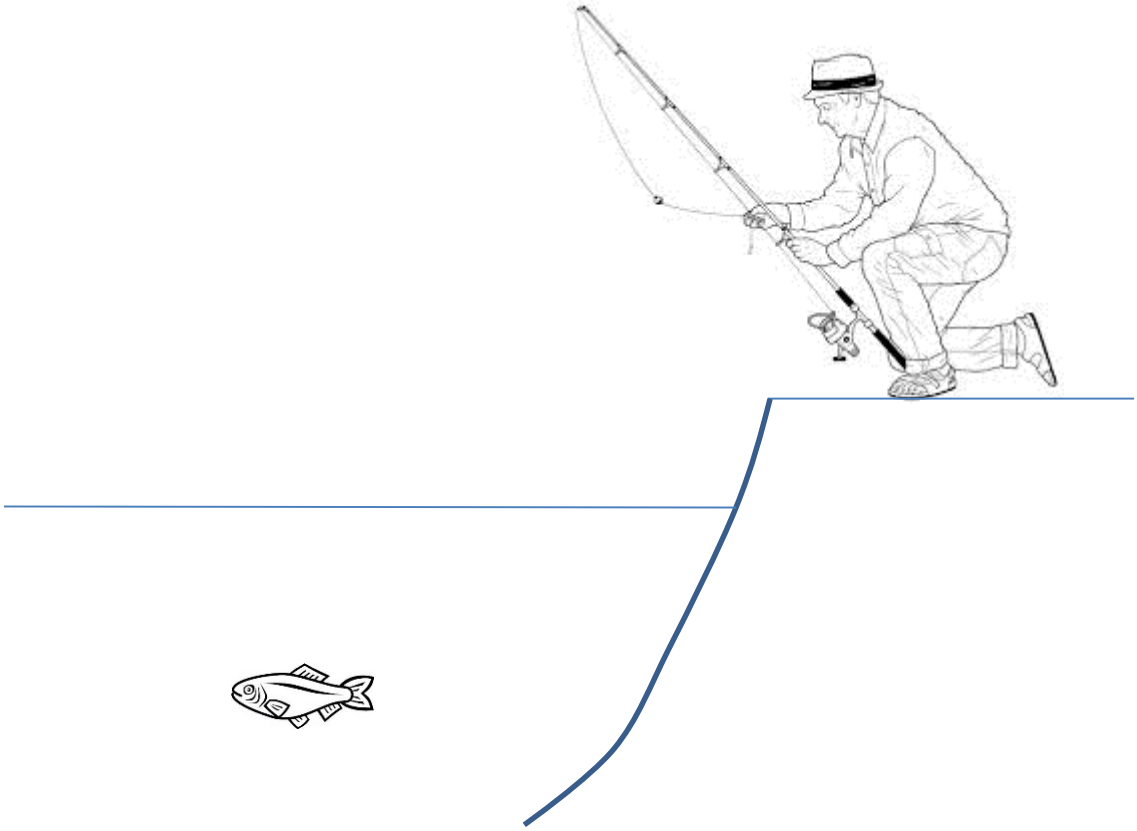
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(2)

(Total 6 marks)

3. The diagram shows a man fishing.



a. Add lines to the diagram showing how the light travels from the fish to the fisherman's eye. (2)

b. Draw on the position of where the fisherman sees the fish. (1)

c. Hence, explain clearly why the fish is not where the fisherman sees it.

……

……

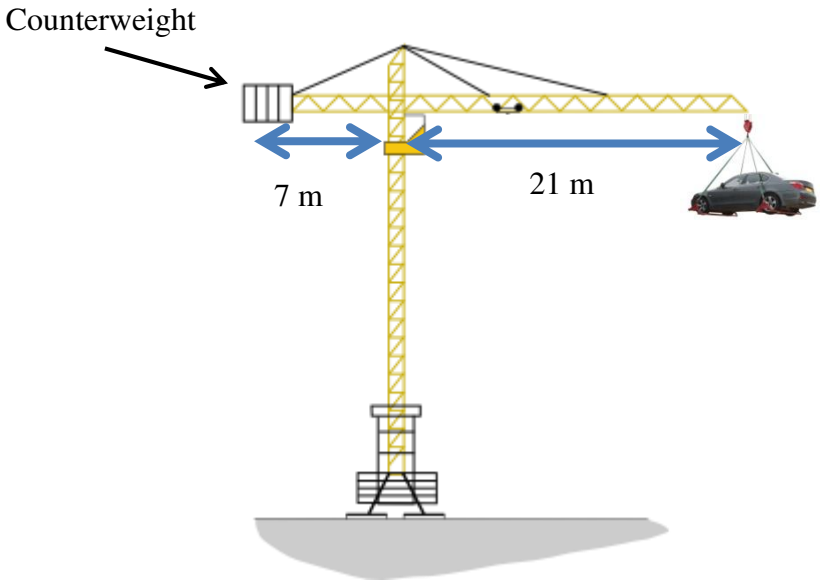
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(3)

(Total 6 marks)

4. Look at the diagram of the crane lifting the car, which weighs 10 000N, below:



The crane is balanced.

a. Calculate the weight of the counterweight.

……

……

……

(3)

b. A gorilla, weighing 2000N has escaped from the local zoo and climbs the tower and then 7m out onto the long arm of the crane towards the car. To prevent the crane from toppling, the operator moves the car inwards towards the tower.

Calculate how far away from the tower the car is when it is once again balanced.

……

……

……

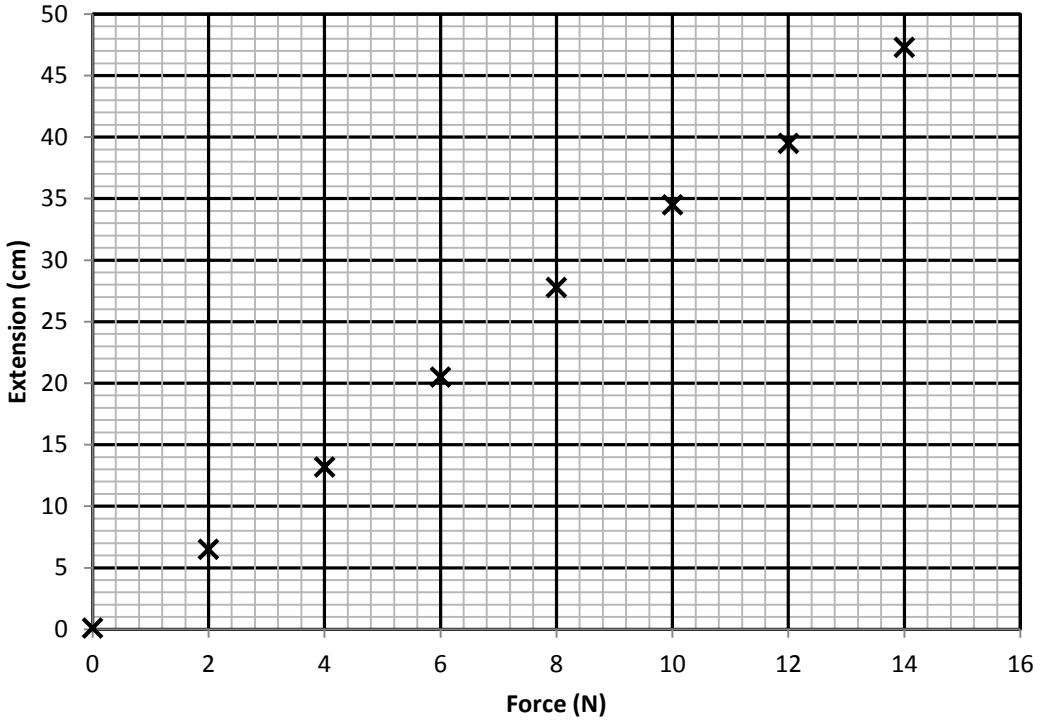
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(3)

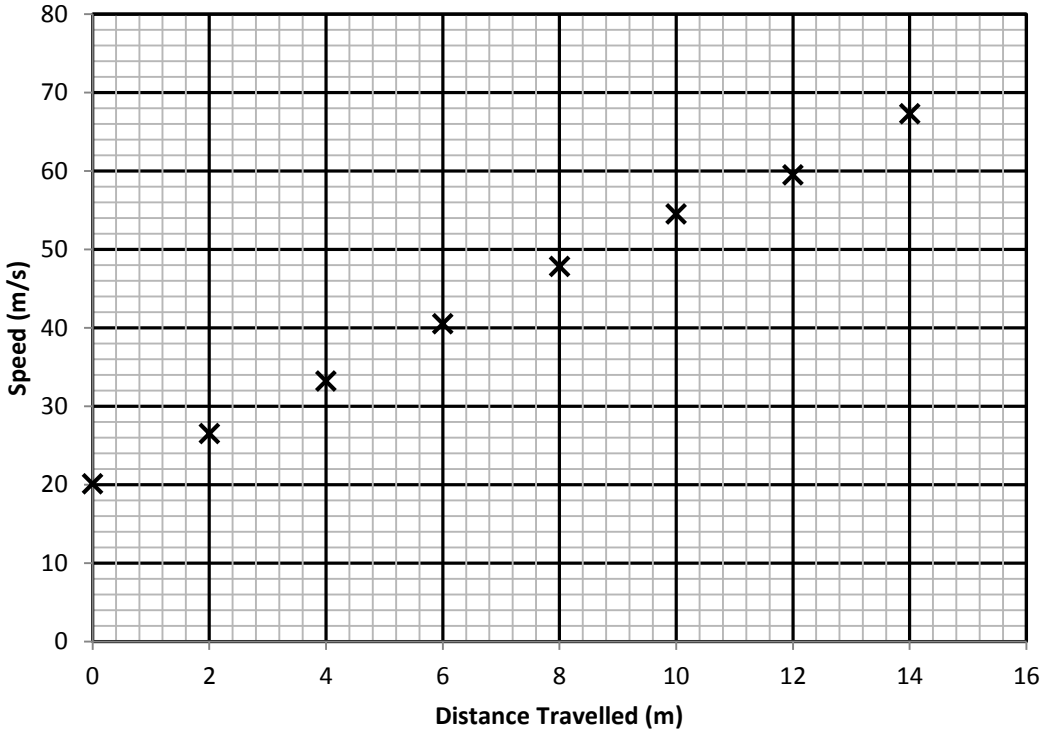
(Total 6 marks)

5. Add lines of best fit to the following graphs:

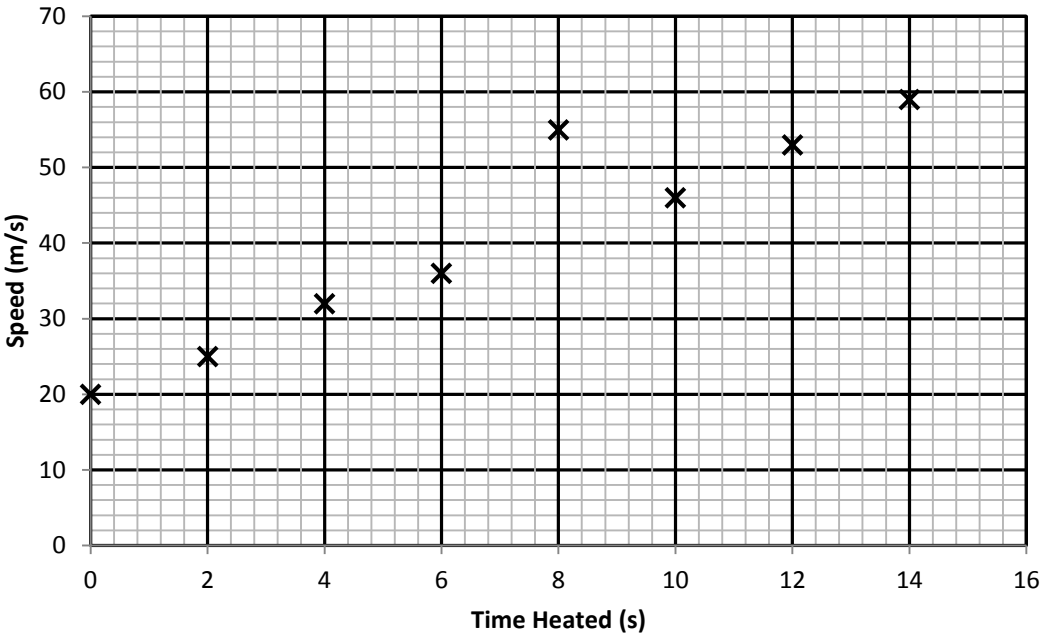
a.



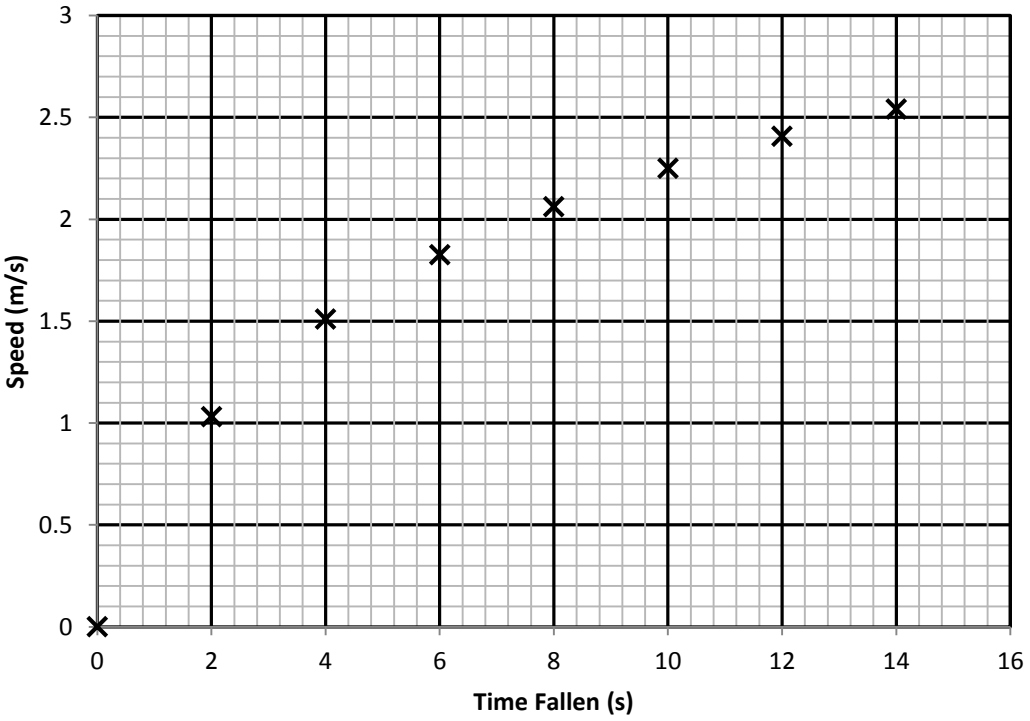
b.



c.



d.



(Total 4 marks)

END OF PHYSICS QUESTIONS

25 MARKS AVAILABLE FOR THIS SECTION