SURNAME ..... FIRST NAME .....

JUNIOR SCHOOL ..... SENIOR SCHOOL .....

Independent Schools Examinations Board

# COMMON ENTRANCE EXAMINATION AT 11+

# SCIENCE

**Specimen Paper**

***(for first examination in Autumn 2018)***

Please read this information before the examination starts.

- This examination is 60 minutes long.
- Answer **all** the questions.
- You are allowed to use a calculator.

28115S04

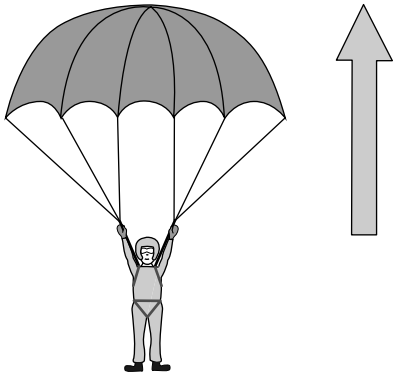
© Independent Schools Examinations Board

1. Underline the option which best completes each of the following.

(a) A diagnostic feature used for classifying vertebrate groups is the

**backbone** **number of legs** **the type of egg laid** **skin covering**

(b)



The force arrow in the diagram above represents

**air resistance** **gravity** **upthrust** **weight**

(c) Day and night are due to the

**Earth orbiting the Sun** **Earth rotating on its axis**

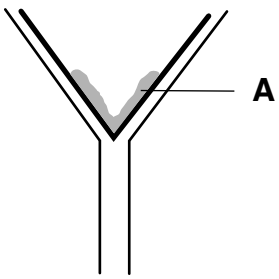
**Moon orbiting the Earth** **Sun rotating on its axis**

(d) An example of everyday chemical change is

**a banana turning black** **chocolate melting**

**ice cream freezing** **water boiling**

(e)




The substance labelled **A** above is the

**filter paper** **filtrate** **remains** **residue**

(f) The glass used for bathroom windows is usually described as

**opaque** **shiny** **translucent** **transparent**

(g) Animals which are active at night are described as

**dormant** **hibernating** **migrating** **nocturnal**

(h) A vertebrate animal with metamorphosis in its life cycle is a

**butterfly** **frog** **lizard** **snake**

(8)

2. Plants and animals can reproduce sexually and asexually.

Sometimes an organism can use both methods of reproduction.

(a) Using the information provided in the table, tick the box which best describes how each organism reproduces.

| organism | description | method of reproduction | | |
|---|---|---|---|---|
| | | sexual | asexual | sexual and asexual |
| amoeba | a single-celled animal<br>when it reaches a certain size it splits into two | | | |
| potato plant | a flowering plant<br>it produces tubers which can grow into new potato plants | | | |
| sheep | a mammal<br>gives birth to live young | | | |
| oak tree | a flowering plant<br>seeds are called acorns | | | |
| yeast | a single-celled fungus<br>reproduces by budding new cells | | | |

(5)

In sexual reproduction, male and female sex cells fuse to form a cell which will divide and grow.

(b) State the name given to the process where sex cells fuse.

..... (1)

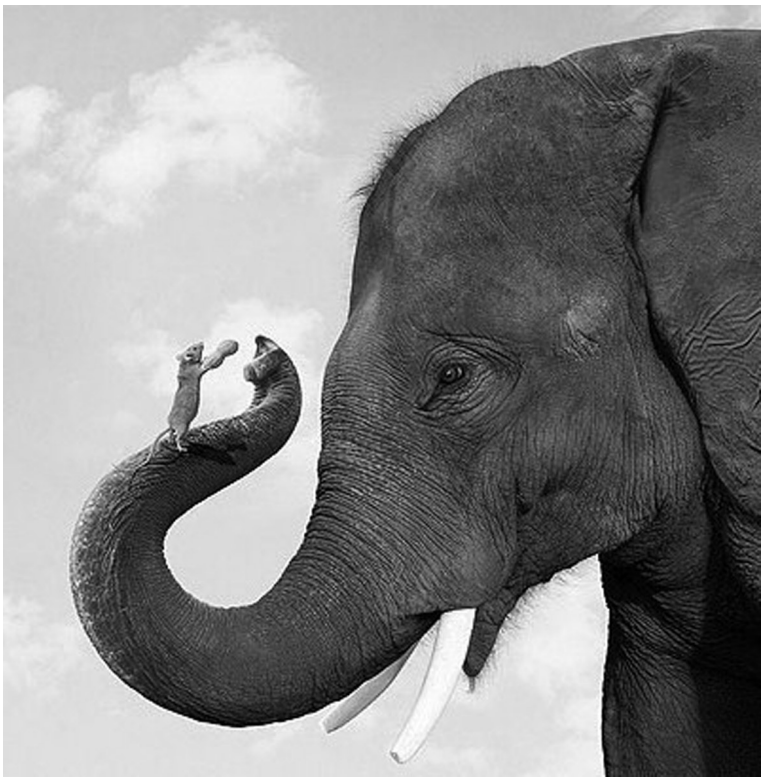
(c) (i) What is the name of the period, in humans, between the fusion of the sex cells and the birth of a baby?

..... (1)

(ii) How long is this period in humans?

..... (1)

In African elephants this period is 660 days (1 year 9 months 20 days), while in a mouse it is only 21 days.



(d) Suggest three reasons why the length of pregnancy (time until birth) in a mouse is so different from that of an African elephant.

1: .....

.....

2: .....

.....

3: .....

..... (3)

3. Jane's mother is making a fresh fruit salad for dessert.

Her mother cuts up the fruit and then makes a syrup with sugar and warm water.

(a) Using words from the box below, complete the following sentences about the fruit salad.

| | | |
|---|---|---|
| **dissolves** | **insoluble** | **soluble** |
| **solute** | **solution** | **solvent** |

(i) The sugar ..... in the water to form the syrup.

(ii) The sugar is ..... in the water.

(iii) The syrup is a ..... of sugar and water.

(iv) The sugar is the ..... and the water is the

..... in the syrup.

(v) The fruit is ..... in the syrup.

(6)

(b) Suggest two ways in which Jane's mother could speed up the way she makes the syrup.

1. .....

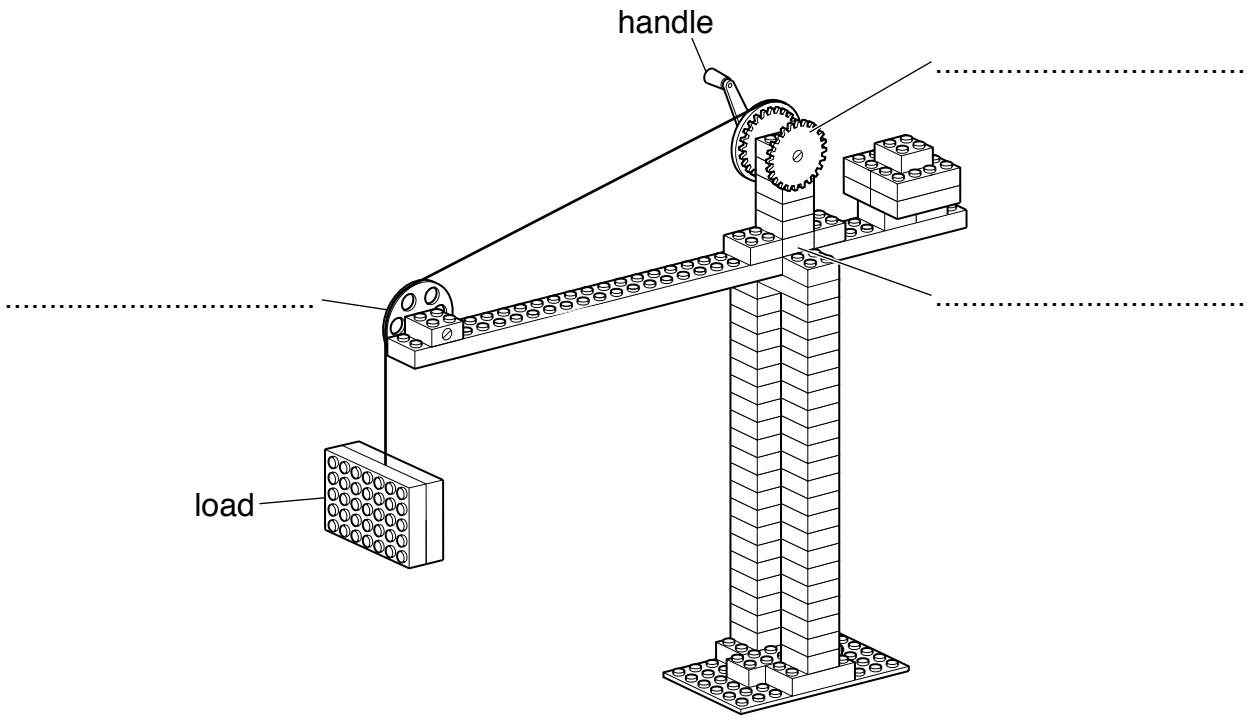
2. ..... (2)

It is recommended that everyone eats five portions of fruit and vegetables each day.

(c) Name two nutrients found in fruit which make it an important part of a balanced diet.

..... and ..... (2)

4. (a) On the drawing of the model crane below, label a gear, a lever and a pulley.




(3)

(b) Describe how each of the parts below works to lift the load when the handle is turned.

gear: .....

.....

lever: .....

.....

pulley: .....

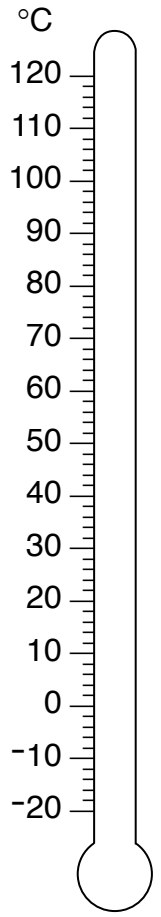
..... (6)

(c) Name two levers which are used every day.

..... and ..... (2)

5. Ann was heating some water in a beaker.

She used a thermometer like the one shown below.




(a) (i) Shade the thermometer to show a temperature of 24 °C. (1)

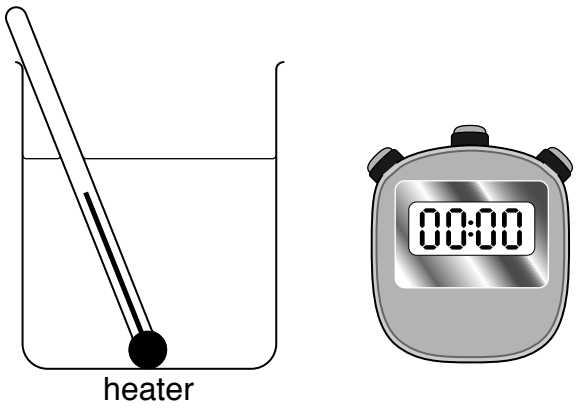
(ii) What steps should Ann take to make sure that the readings from the thermometer are accurate?

.....

.....

..... (2)

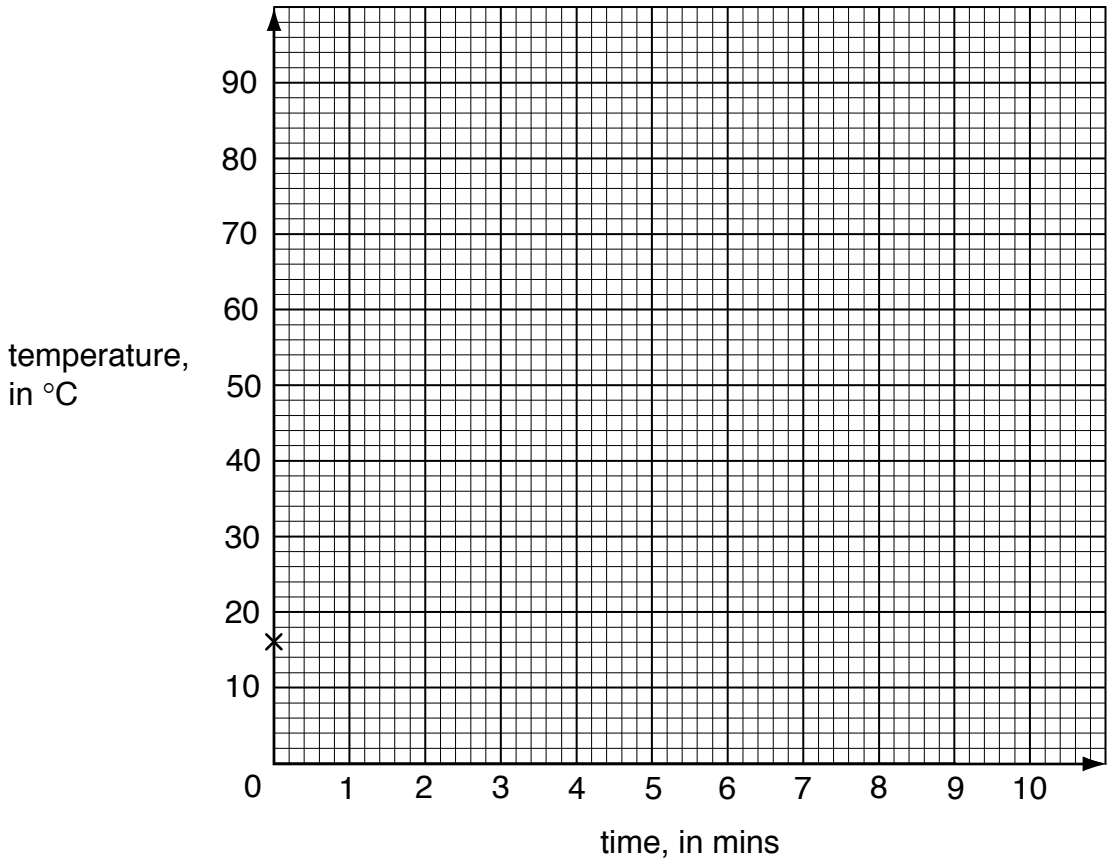
Ann heated the water and measured the temperature every minute.




Her results are shown in the table below.

| time, in mins | temperature, in °C |
|---|---|
| 0 | 16 |
| 1 | 23 |
| 2 | 32 |
| 3 | 43 |
| 4 | 54 |
| 5 | 60 |
| 6 | 68 |
| 7 | 75 |
| 8 | 80 |
| 9 | 86 |
| 10 | 92 |

(b) (i) Plot a graph on the grid below to show the results from the table.
*(The first point has been done for you.)*




(5)

(ii) Draw a curve of best fit through the points. (1)

Ann found that the level of the water had gone down during the experiment.

(c) What process was happening to make the level of water go down?

..... (1)

6. In the 1930s, materials such as nylon and polyester were invented.

People preferred these because they did not need to be ironed.

(a) Name two man-made materials mentioned in the sentences above.

..... and ..... (2)

Cotton farmers were worried until a woman called Ruth Benerito developed wrinkle-free cotton in the 1950s.

Ruth and her team discovered that cotton fibres were weak and easily broken and that this was the cause of the cotton wrinkling.

She used her chemical research to make the fibres much stronger so that they did not break.

Further research allowed other properties such as stain-resistance and flame-resistance to be added to the cotton.

(b) State whether you think wrinkle-free cotton can be considered as a natural material.

.....

Explain your answer.

.....

.....

..... (2)

Your class wants to test how strong the cotton fibres are before and after treatment.

(c) (i) Complete the following plan for your investigation to ensure it is a fair test.

I am going to change .....

.....

I am going to measure .....

.....

I am going to keep .....

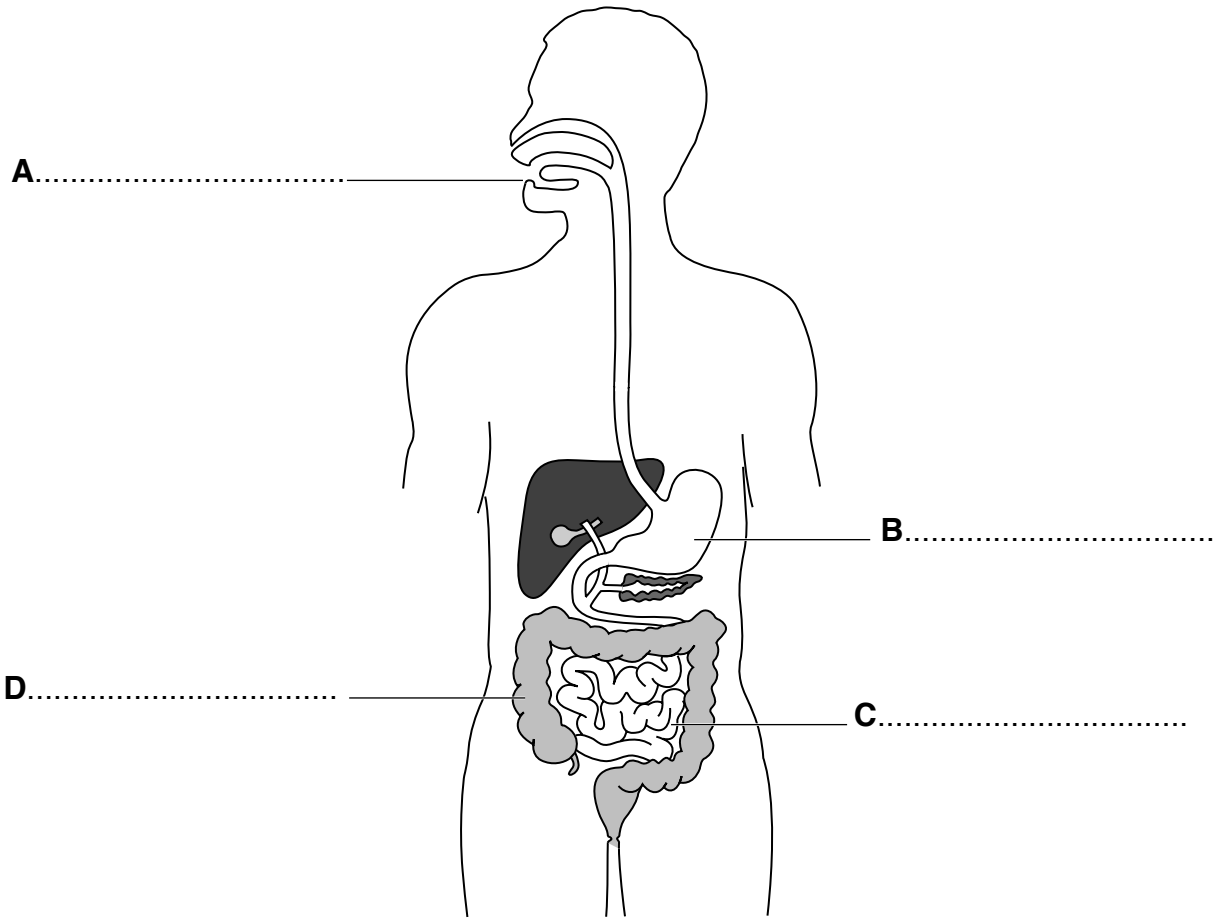
..... the same. (4)

Your teacher suggests that you repeat the experiment.

(ii) Why is it a good idea to repeat the experiment?

..... (1)

7. (a) Complete the labels on the diagram below of the human digestive system.




(4)

(b) Describe the digestive processes in each of the labelled parts on the diagram above.

**A:** .....

..... (2)

**B:** .....

..... (2)

**C:** .....

..... (2)

**D:** .....

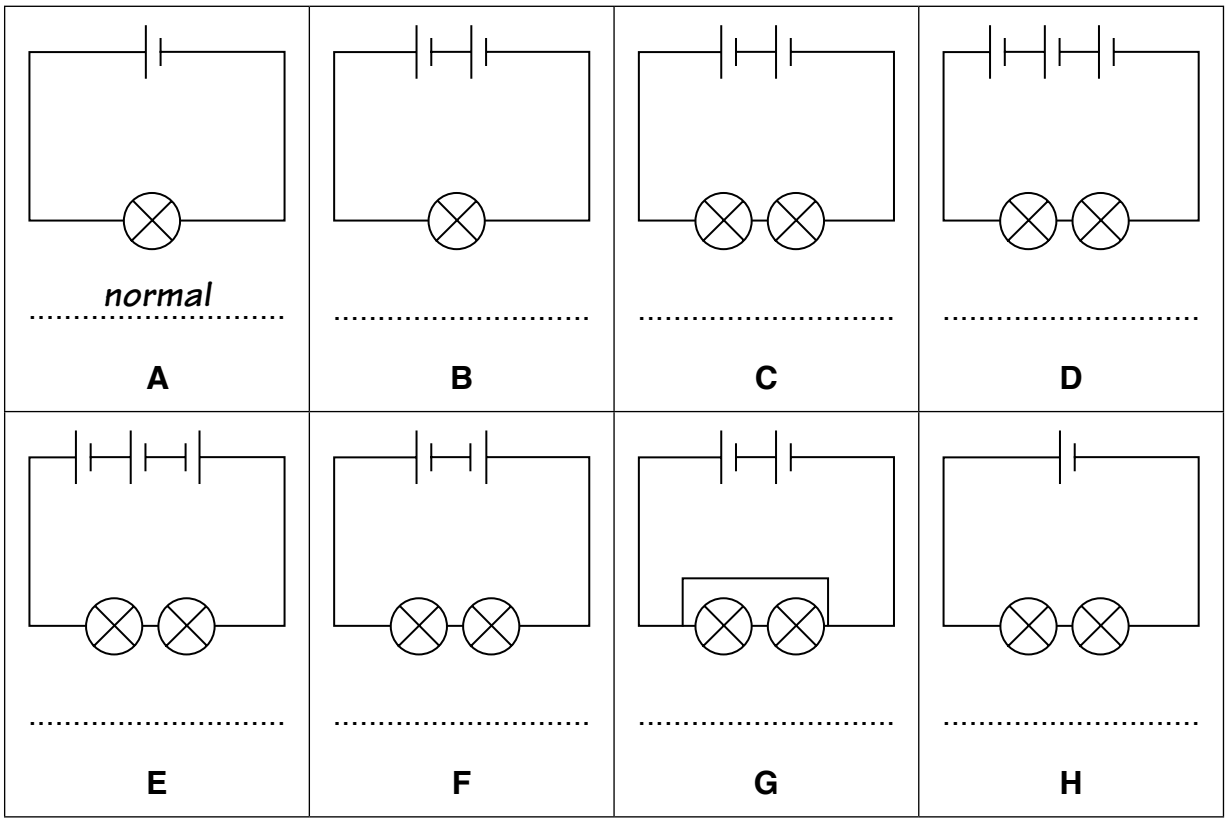
..... (2)

8. The bulb in the first circuit shown below is at **normal** brightness.

(a) Using words from the box below, complete the labels beneath the circuits to show the brightness of the bulbs in each one.

*(Words may be used once, more than once or not at all.)*

| bright | brightest | dim | normal | out |
|---|---|---|---|---|




(7)

It is important to work safely with electricity.

(b) Suggest two things which can make an electric circuit safer.

1: .....

2: ..... (2)

(Total marks: 80)