Write your name here

Surname	Other names

Pearson Edexcel GCSE

Centre Number | | | | | |

Candidate Number | | | | |

Biology/Additional Science

Unit B2: The Components of Life

Foundation Tier

Friday 9 June 2017 – Morning
Time: 1 hour

Paper Reference
5BI2F/01

You must have:
Calculator, ruler

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
  – *there may be more space than you need.*

Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets
  – *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
  – *you should take particular care with your spelling, punctuation and grammar, as well as the clarity of expression, on these questions.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ▶

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P 4 8 5 4 2 A 0 1 2 0

Pearson

Answer ALL questions

Some questions must be answered with a cross in a box ☒.
If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Leaves and photosynthesis

1 The photograph shows a leaf.

© Krzysztof P. Jasiutowicz

(a) (i) Describe how the leaf produces glucose.

(2)

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.....

.....

.....

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.

(1)

Glucose diffuses into other cells

☒ **A** from an area of low concentration to an area of high concentration

☒ **B** from an area of high concentration to an area of low concentration

☒ **C** across a membrane using energy from respiration

☒ **D** across a membrane using energy from transpiration

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(iii) Complete the sentence by putting a cross (☒) in the box next to your answer.

Xylem vessels transport

(1)

☒ **A** water from the roots to the leaves

☒ **B** water from the leaves to the roots

☒ **C** sugars from the roots to the leaves

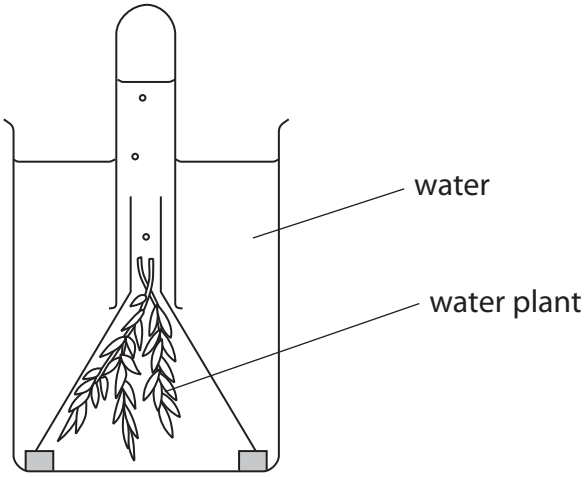
☒ **D** sugars from the leaves to the roots

(b) Draw one straight line from each plant cell structure to its function.

(2)

plant cell structure	**function**
cell wall	contains cell sap which stores nutrients
vacuole	controls how much oxygen leaves the plant
	contains cellulose to give the cell strength
	releases energy for the cell
	increases the amount of light absorbed by the cell

(c) A student investigated the amount of oxygen released from a water plant.



The student counted the number of gas bubbles produced by the water plant every minute at different temperatures.

The results are shown in the table.

temperature / °C	number of gas bubbles produced every minute
5	2
15	14
25	26
35	16
45	7

Describe the effect of temperature on the number of gas bubbles produced every minute.

(2)

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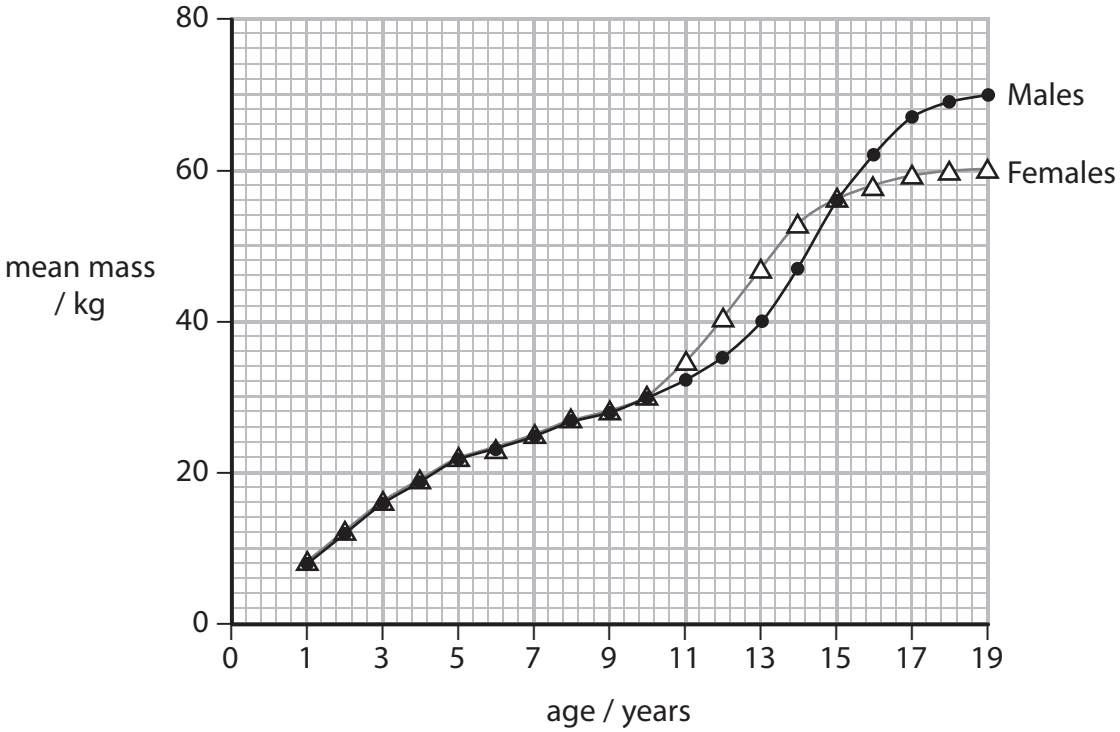
(Total for Question 1 = 8 marks)

Growth

2 (a) The graph shows the mean mass of males and females from the age of 1 year to 19 years.



(i) Calculate the difference in the mean mass of males and females at the age of 19 years.

(2)

difference in mean mass = ... kg

(ii) Describe how the mean mass of the males would have been obtained at the age of 19 years.

(2)

.....

.....

.....

.....

(b) Some nutrients in food provide the body with energy needed for growth.

Use words from the box to complete the passage about the chemical reaction that releases energy from food.

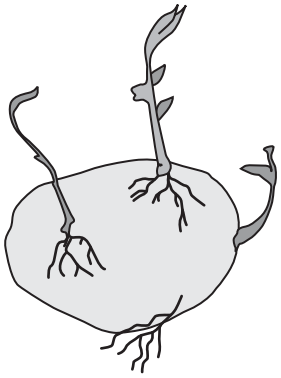
(2)

hydrogen	sunlight	lactic acid	glucose
	carbon dioxide	nitrogen	

Body cells use ..... for respiration.

Aerobic respiration produces ..... which is removed by the lungs.

(c) The diagram shows several shoots growing from one potato.
Each shoot can grow into a new potato plant.



Explain why the new potato plants are clones of the original potato.

(2)

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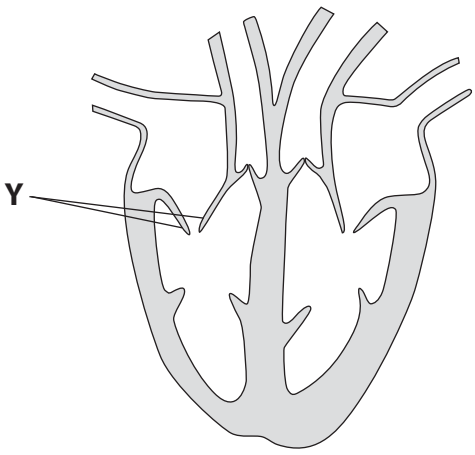
(Total for Question 2 = 8 marks)

The heart and blood

3 The diagram shows the main blood vessels and structures of the heart.



(a) (i) Draw a line to show the aorta on the diagram.
Label this line X.

(1)

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.

(1)

The wall of the left ventricle is thicker than the wall of the right ventricle.

This is because the left ventricle pumps

☒ **A** blood containing more carbon dioxide

☒ **B** blood faster when you are exercising

☒ **C** blood to all parts of the body

☒ **D** blood to the lungs

(iii) Explain the function of the structure labelled **Y**.

(2)

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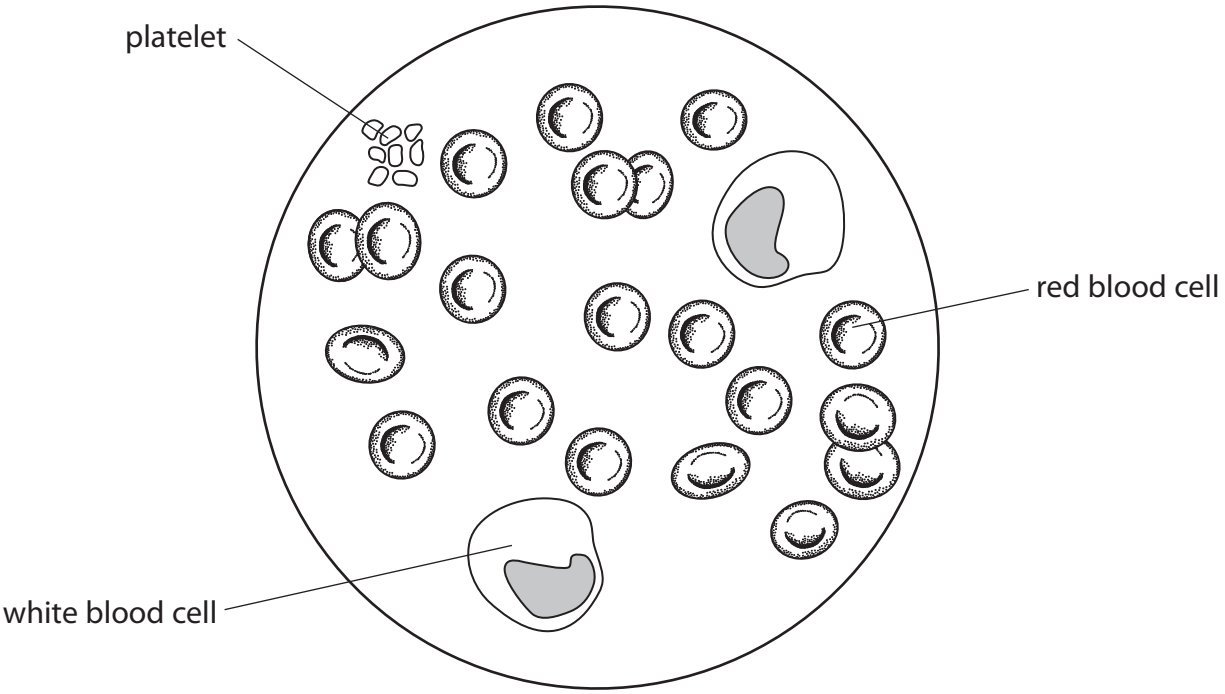
(b) The diagram shows a blood sample from a patient.



(i) State the ratio of red blood cells to white blood cells in this blood sample.

(1)

.....

(ii) Complete the sentence by putting a cross (☒) in the box next to your answer.

(1)

Platelets in the blood

☒ **A** transport glucose

☒ **B** transport carbon dioxide

☒ **C** have a nucleus

☒ **D** are involved in blood clotting

(iii) The blood sample shows that the patient has a higher number of white blood cells than normal.

Suggest why this patient has a higher number of white blood cells.

(2)

(iv) Red blood cells are adapted to carry oxygen.

Explain how one feature of a red blood cell increases the amount of oxygen carried.

(2)

(Total for Question 3 = 10 marks)

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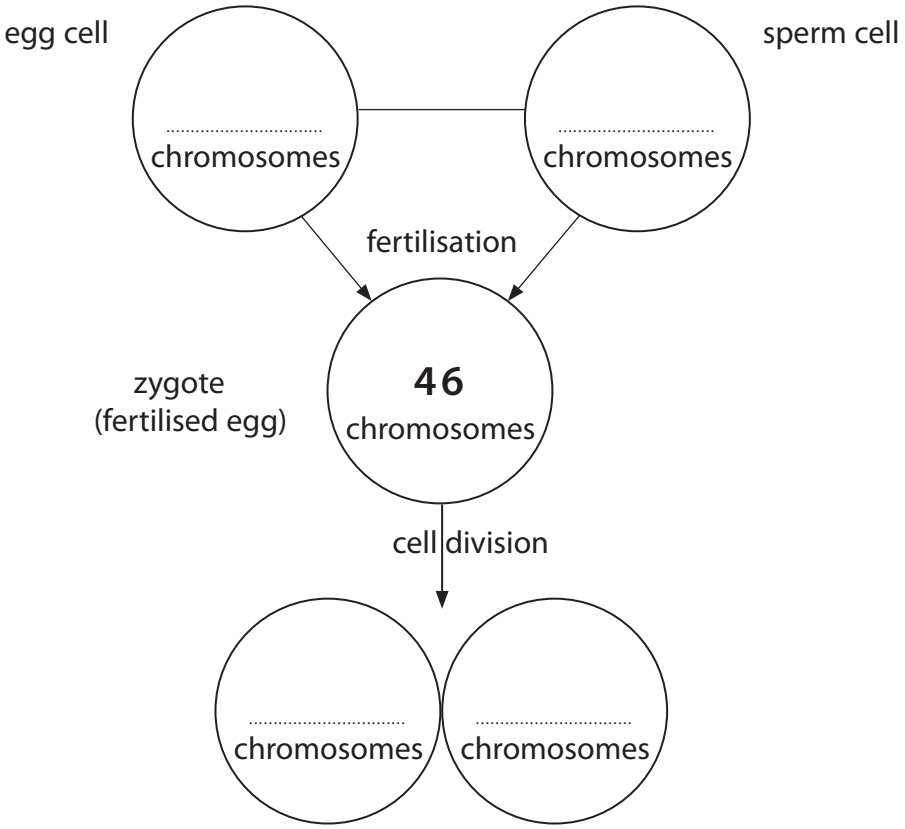
Cells and reproduction

4 (a) The diagram shows the stages involved in the production of a human embryo.



(i) Complete the diagram by stating the number of chromosomes found in the egg cell, the sperm cell and each cell of the embryo.

(2)

(ii) Use the words in the box to complete the sentences.

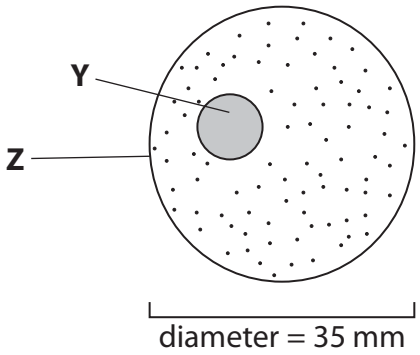
(2)

haploid	respiration	diploid
meiosis	identical	mitosis

The sperm cells are produced by a process called .....

This process produces ..... cells.

(b) The diagram shows a zygote.



(i) Complete the table to give the name of part **Y** and the function of part **Z**.

(2)

part	name of part	function of part
Y	.....	contains DNA that controls the activities of the cell
Z	cell membrane	....

(ii) The diameter of the diagram is 35 mm.
The diagram is 5000 times larger than the actual zygote.

Calculate the diameter of the zygote.

(2)

diameter = ... mm

(iii) The DNA in the zygote contains bases.

Describe how bases are paired in DNA.

(2)

(c) Complete the sentence by putting a cross (☒) in the box next to your answer.

(1)

Stem cells from embryos are

☒ **A** differentiated cells

☒ **B** undifferentiated cells

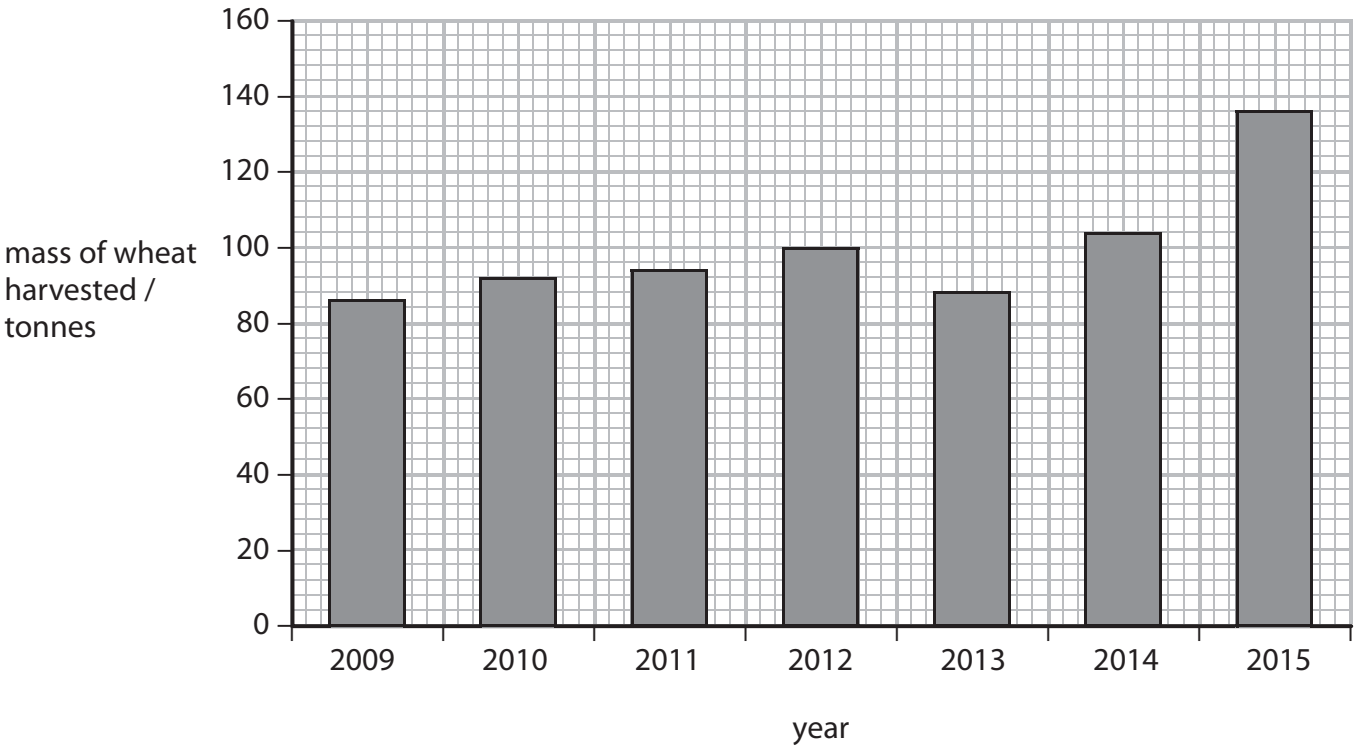
☒ **C** specialised cells

☒ **D** sex cells

(Total for Question 4 = 11 marks)

Wheat yields

5 The bar chart shows the mass of wheat harvested on a farm each year from 2009 to 2015.



(a) Put a cross (☒) in the box next to your answer.

Which of the statements about the mass of wheat harvested are true?

1. The mass of wheat harvested increased every year.
2. In 2012, 100 tonnes of wheat was harvested.

(1)

☒ **A** statement 1 only

☒ **B** statement 2 only

☒ **C** both statement 1 and 2

☒ **D** neither statement 1 nor 2

(b) Describe how wheat plants absorb water from the soil.

(2)

.....

.....

.....

.....

.....

(c) Crop plants can be genetically modified.

State **two** genetic modifications that can improve crop plants.

(2)

1 .....

.....

2 .....

.....

*(d) A farmer estimated the total number of wheat plants in a field.

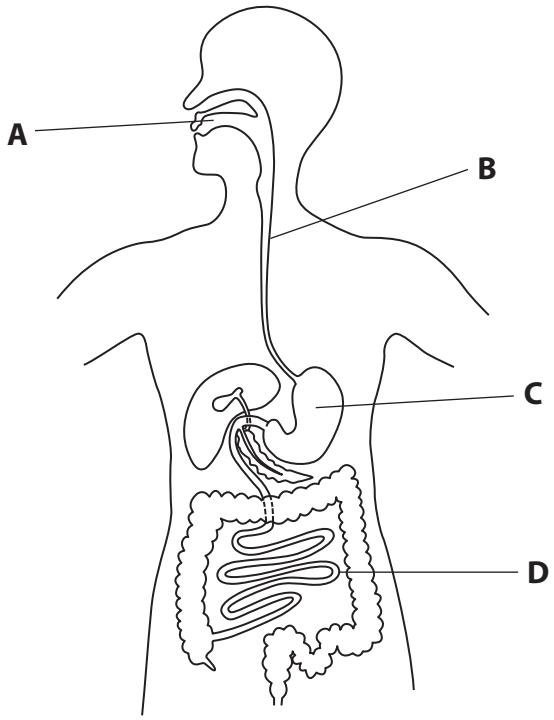
Describe a method to estimate the total number of wheat plants in a 100 m^2 area of a field.

(6)

(Total for Question 5 = 11 marks)

Enzymes and digestion

6 The diagram shows the human digestive system.



(a) (i) Complete the sentence by putting a cross (☒) in the box next to your answer.

(1)

Amylase begins the breakdown of starch in the part of the digestive system labelled

- ☒ **A**
- ☒ **B**
- ☒ **C**
- ☒ **D**

(ii) State the product of carbohydrate digestion.

(1)

.....

(b) Describe the functions of the small intestine in the digestive system.

(2)

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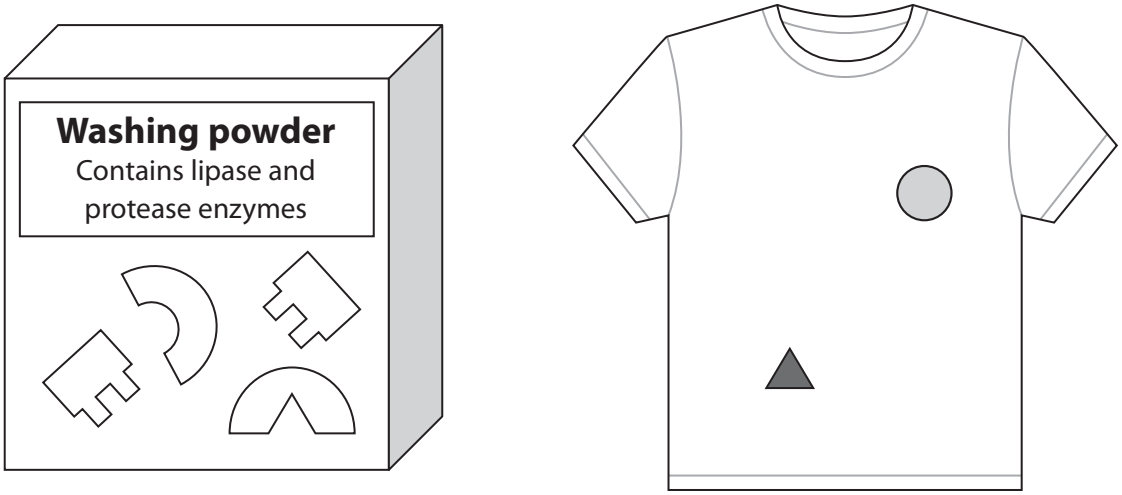
*(c) (i) The diagram shows a box of washing powder that contains lipase and protease enzymes and a shirt stained with food molecules.



Explain why lipase and protease enzymes are used in some washing powders.

(6)

(ii) Suggest why washing powders containing enzymes should **not** be used at a temperature of 80 °C.

(2)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 60 MARKS

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