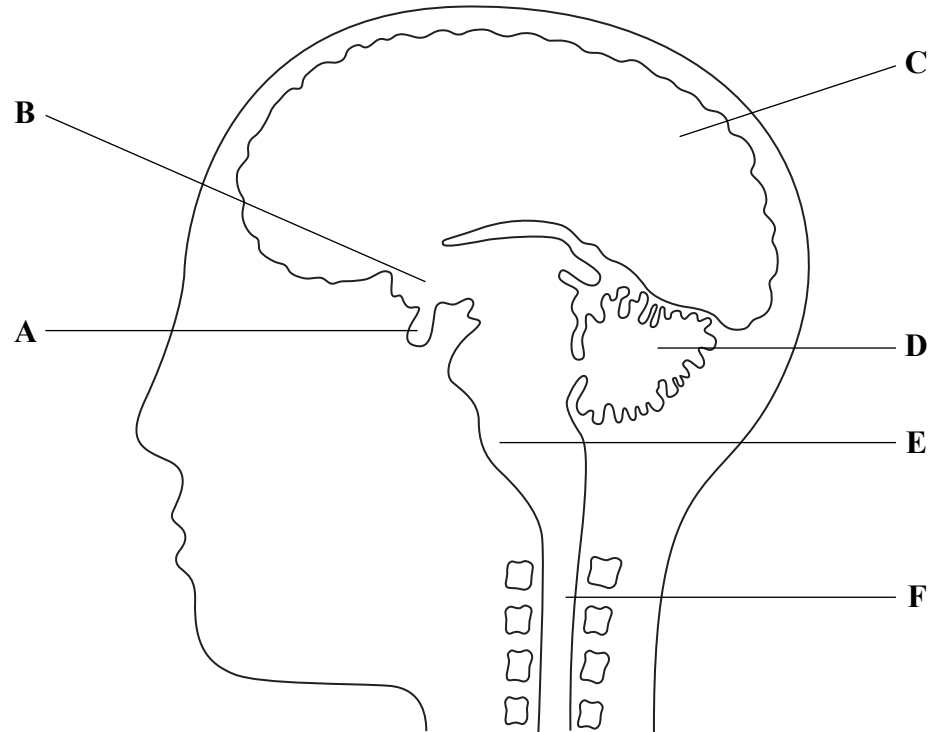


Answer ALL the questions.

1. The diagram below shows a section through the brain.



(a) Name the regions labelled C, E and F.

C

E

F

(3)

(b) Complete the table below to show which of the regions, A to F, is responsible for each function.

Function	Region
Balance and muscle coordination	
Stimulating the action of involuntary muscles	
Production of sex hormones	
Intelligence and reasoning	

(4)



(c) Explain why death occurs if part E is destroyed in an accident.

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(2)

(Total 9 marks)

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Q1



N 3 3 4 1 3 A 0 3 2 4

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2. An investigation was carried out on the loss of heat by a man who entered a hot room at 45 °C and then lay down.

The temperature of the man's skin and his core temperature (internal) were recorded at intervals. After 25 minutes from the start of the investigation the man drank a small quantity of iced water.

The results are shown in the table below.

Time in minutes	Skin temperature in °C	Core temperature in °C
0	36.9	37.5
10	36.9	37.5
20	36.9	37.5
25	36.9	37.5
30	37.0	37.4
35	37.5	36.9
40	37.6	37.1
45	37.1	37.3
50	37.0	37.5
55	37.0	37.5

- (a) Explain why the core temperature is usually higher than skin temperature.

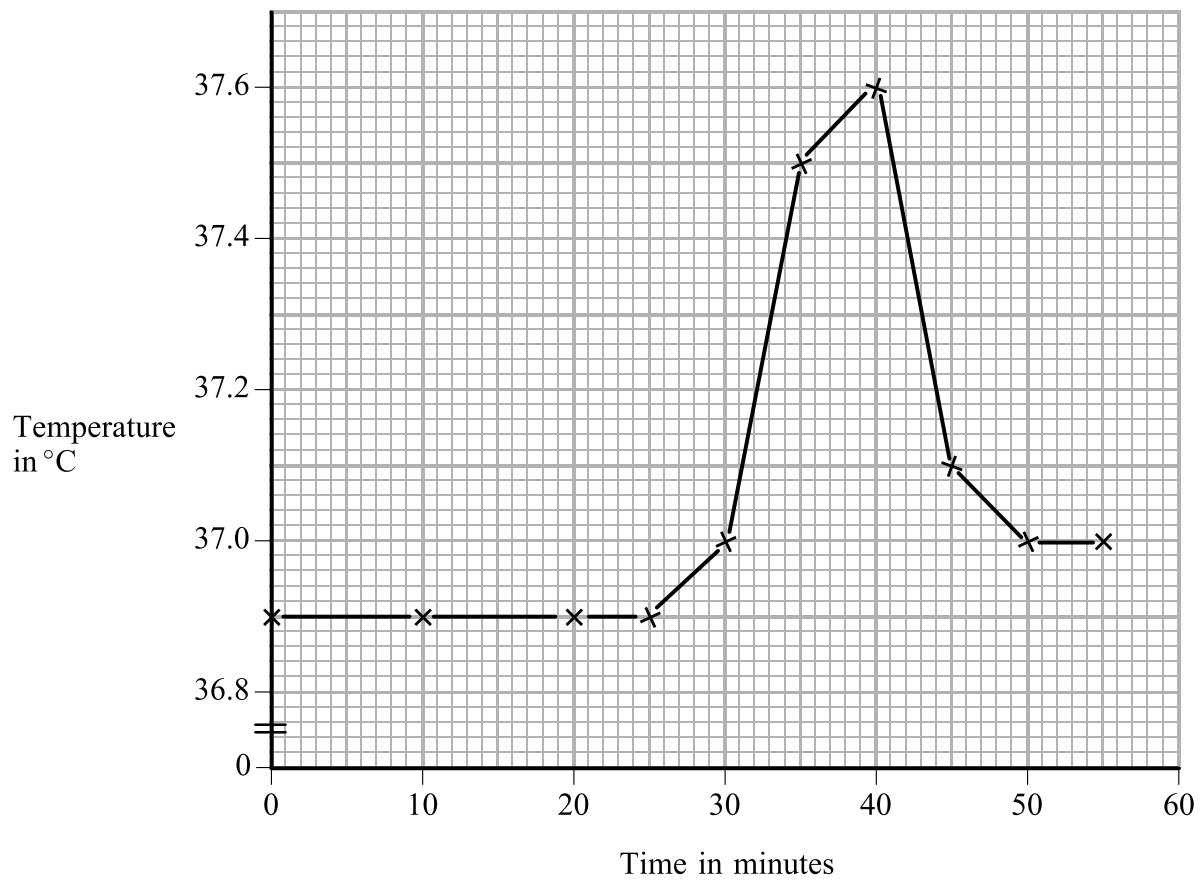
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(2)



(b) (i) The results for skin temperature have been plotted as a line graph.

Plot the results for core temperature as a line graph on the same axes. Label your graph curves.



(4)

(ii) During which time period was core temperature lower than skin temperature?

From to
(1)

(iii) Suggest why core temperature dropped during this period.

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.....
(2)

(iv) Where is temperature regulation controlled in the body?

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(1)



(c) Explain why is it important that the core temperature remains within narrow limits.

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(2)

(Total 12 marks)

Leave
blank

Q2



Leave
blank

3. The table below lists information about some diseases.

Complete the table to show the causative agent and method of transmission of each of the diseases. Some answers have been completed for you.

Disease	Causative agent	Method of transmission
Diphtheria		droplet infection
Typhus	rickettsia	
Malaria		
Athlete's foot		contact with infected clothing, towels or floor
Poliomyelitis	virus	
Gonorrhoea	bacterium	

(Total 7 marks)

Q3

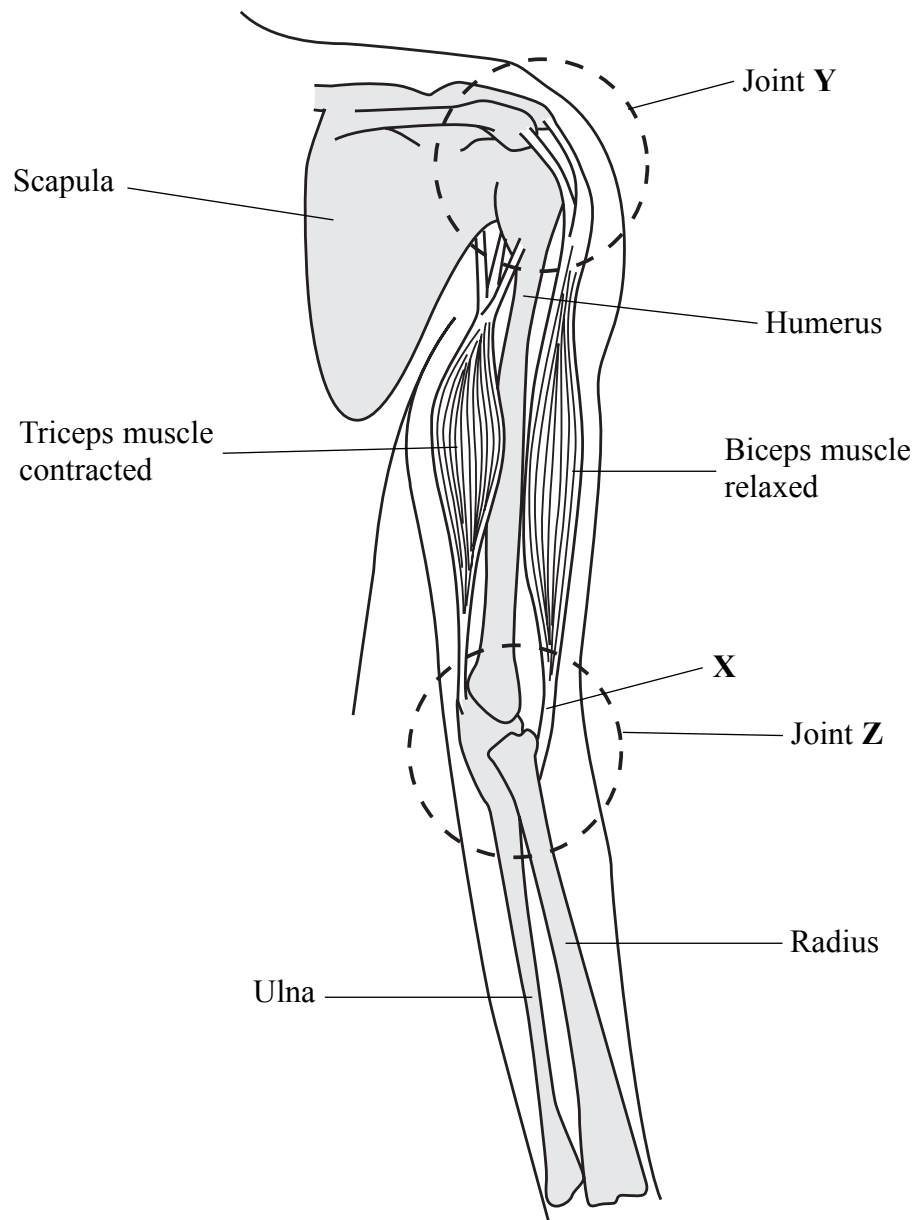
7

Turn over



Leave blank

4. The diagram below shows the bones and muscles of the arm when it is extended (straightened out).



(a) (i) In the space below, draw these structures to show their shape and position when the arm is bent at the elbow.

Leave
blank

(6)



N 3 3 4 1 3 A 0 9 2 4

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blank

(ii) Describe the function of **X** when the arm is bent at the elbow.

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.....

(2)

(b) (i) Name the types of joints found at **Y** and at **Z**.

Y

Z

(2)

(ii) How does movement at **Y** differ from that at **Z**?

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.....
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(2)



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blank

(c) Both joints are involved in movement. To reduce friction at a joint, the ends of the bones are covered in cartilage.

(i) Describe **one** other way in which friction at the joint is reduced.

.....
.....

(1)

(ii) In one form of arthritis, the cartilage covering the ends of the bones is worn away.

Suggest how this damage might affect movement at a joint.

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(2)

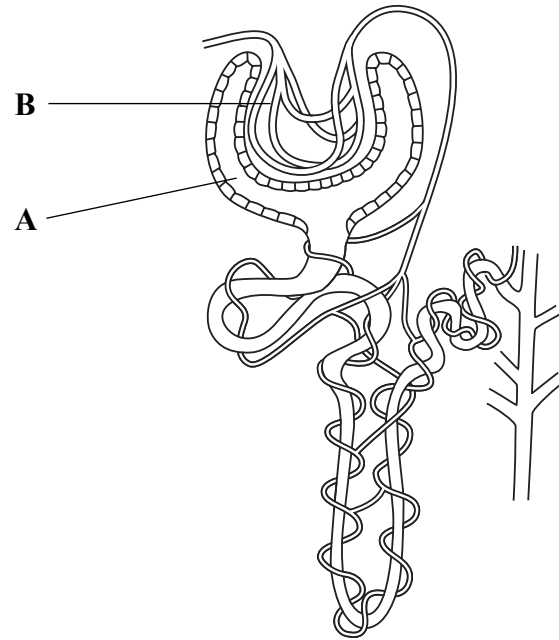
Q4

(Total 15 marks)

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5. The diagram below shows a kidney tubule.



(a) (i) Name the structures labelled **A** and **B**.

A

B

(2)

(ii) Explain how fluid passes into **A**.

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.....
.....
.....
.....

(3)

(iii) Name **two** components of the blood that do not pass into **A**.

1

2

(2)

(iv) On the diagram, label with a letter **G** the region where glucose is reabsorbed.

(1)



Leave
blank

(b) The amount of water reabsorbed from the tubule varies from day to day.

(i) Give reasons why this variation occurs.

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(3)

(ii) Describe the process by which the reabsorption of water from the tubule is controlled.

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(4)

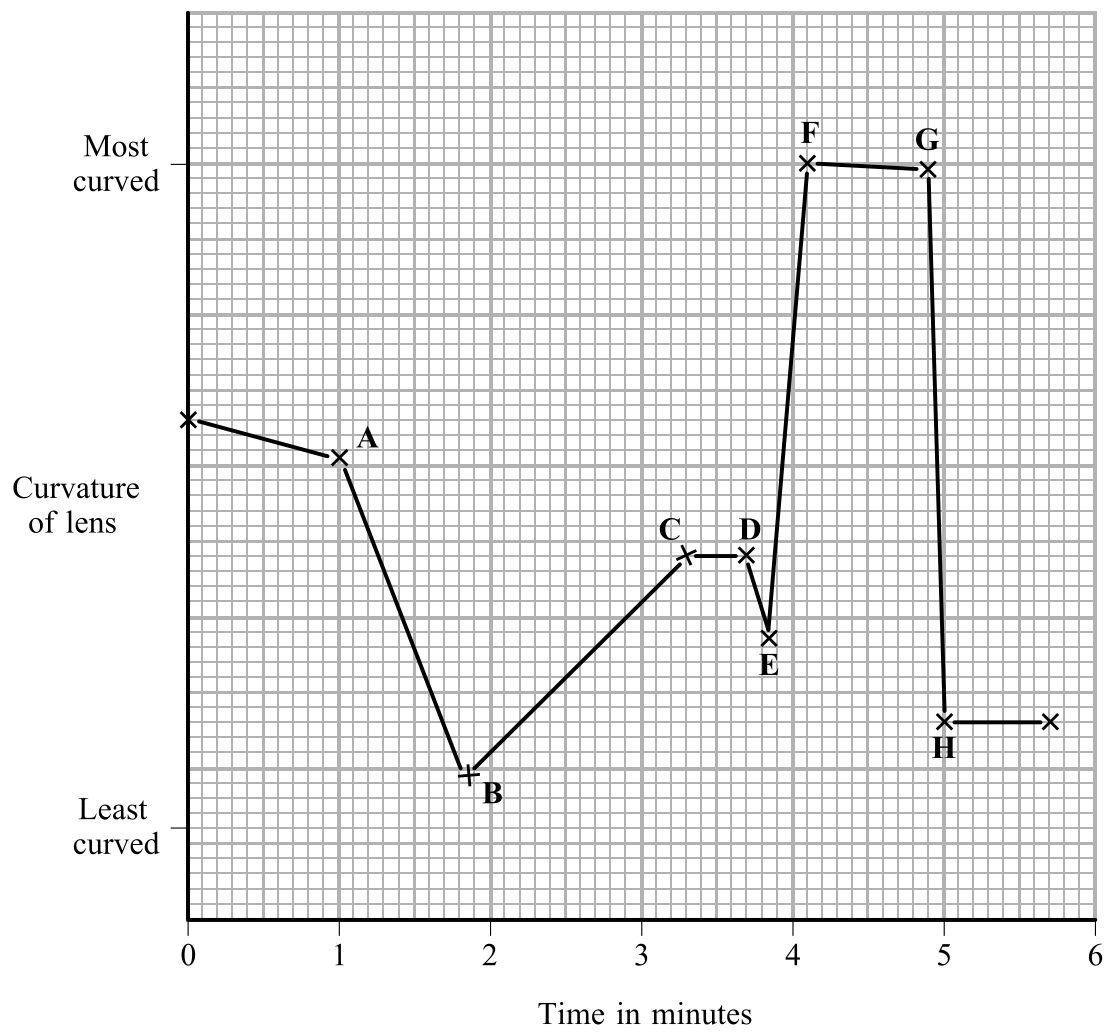
(Total 15 marks)

Q5

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6. The diagram below shows the variation in the curvature (roundness) of the lens of a man's eye as he watches a bird. He keeps the bird in focus as it moves around.



- (a) (i) At which point was the bird furthest from the man?

..... (1)

- (ii) Between which two points is the bird feeding on the ground near to him?

..... (1)

- (iii) During which period was the bird flying slowly towards the man?

..... (1)



(b) Explain how the curvature of the lens of the eye is decreased to view a distance object.

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(4)

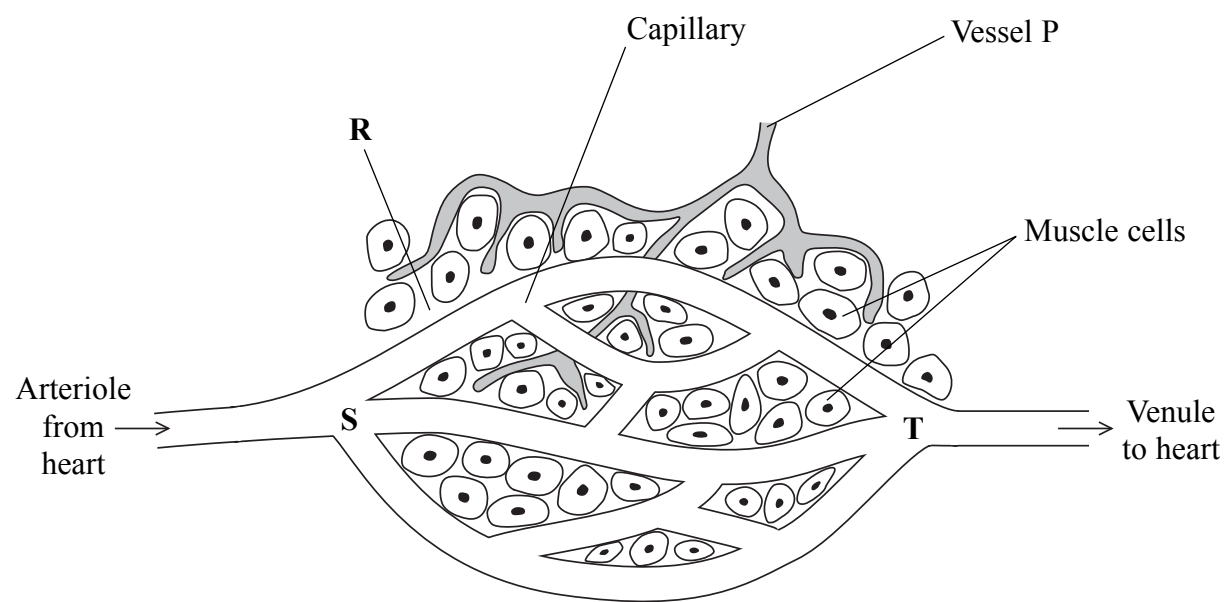
(Total 7 marks)

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Q6



7. (a) The diagram below shows a capillary network around some muscle cells.



(i) Name the fluid at **R**.

..... (1)

(ii) Describe **two** ways in which the fluid at **R** differs from blood plasma.

1

.....

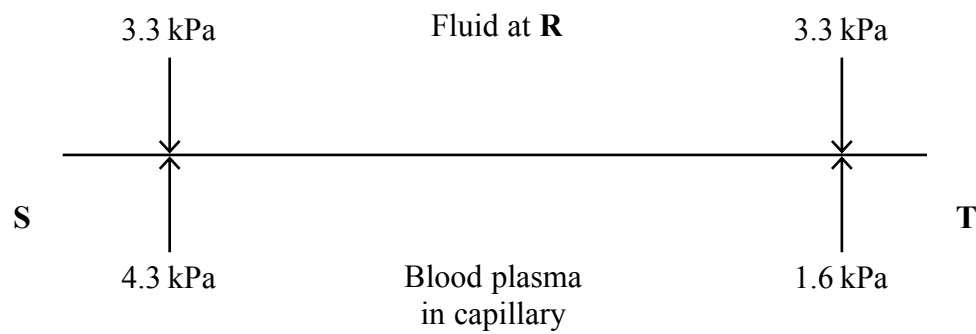
2

..... (2)



(b) The diagram below shows the pressure at two positions (**S** and **T**) in the capillary network and in the surrounding fluid at **R**. Pressure is measured in kilopascals (kPa).

The arrows indicate the direction in which each pressure is having its effect.



(i) What is the difference in pressure between the fluid at **R** and the blood plasma at **S**?

..... (1)

(ii) In which direction is there likely to be a net movement of fluid at **S**?

..... (1)

(iii) The muscle cells are surrounded by the fluid at **R**. What is the importance of this to the muscle cells?

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..... (3)



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(c) (i) At **T** the pressure in the capillary is much lower than at **S**. Suggest a reason for this.

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(1)

(ii) The inward pressure at **T** is greater than the outward pressure. What effect does this have on the movement of materials?

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.....
(2)

(d) Less fluid returns to the venule at **T** than arrived in the arteriole at **S**. The remaining fluid drains into the vessel labelled **P**.

(i) Name the fluid in vessel **P**.

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(1)

(ii) What happens to this fluid?

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(2)

(Total 14 marks)

Q7

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8. Four blood groups occur in humans: group A, group AB, group B and group O. These are the result of inheriting two out of three possible blood group alleles: I^A , I^B or I^O .

I^O is recessive to both I^A and I^B .

(a) (i) State the **two** possible genotypes of a person who has blood group A.

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

(ii) State the genotype of a person with blood group AB.

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

(b) A woman who is heterozygous for blood group B has a child whose father has blood group AB.

(i) In the space below draw a genetic diagram to show the possible genotypes and phenotypes of this child.

(4)

(ii) What is the chance that the child has blood group B and is a girl?

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



Leave
blank

(c) Haemophilia is a disorder in which the blood does not clot. The blood clotting gene is carried on the X chromosome. Haemophilia is caused by the recessive allele of this gene. Explain why haemophilia is much more likely to affect males rather than females.

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(4)

Q8

(Total 12 marks)



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9. (a) Sugar in the diet is likely to increase tooth decay.

(i) Explain how sugar can bring about tooth decay.

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(3)

(ii) Describe **two** ways in which a person who eats sweets can reduce the chances of having tooth decay.

1

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2

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(2)



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(b) Explain the risks to the health of a child with each of the following diets.

(i) A diet deficient in protein.

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(2)

(ii) A diet containing too much fat or carbohydrate.

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(2)

Q9

(Total 9 marks)

TOTAL FOR PAPER: 100 MARKS

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