PEARSON EDEXCEL GCSE COMBINED SCIENCE (HIGHER) · 1SC0

BIOLOGY



EXAM QUESTION PACK

TOPIC 2: CELLS AND CONTROL (PAPER 1, PACK 2)

SCORE	PERCENTAGE
/16	%

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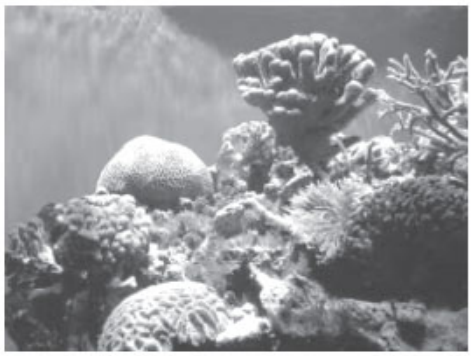
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Q1.

Corals are animals that live on the sea bed.

The photograph shows some species of coral.



Corals can reproduce sexually, releasing sperm cells into the water.

The mass of DNA in one sperm cell from a species of coral is 0.5 picogram.

(i) Suggest the mass of DNA that would be present in an unfertilised egg cell of the same species.

(1)

.....

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

The term used to describe the number of chromosomes in an egg or sperm cell is

(1)

☒ **A** diploid

☒ **B** gamete

☒ **C** haploid

☒ **D** zygote

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

The base pairs in DNA are

(1)

☒ **A** thymine with adenine, cytosine with guanine

☒ **B** thymine with guanine, adenine with cytosine

☒ **C** uracil with adenine, guanine with cytosine

☒ **D** uracil with thymine, guanine with cytosine

(iv) Name the bond that joins the base pairs together.

(1)

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Q2.

The mitotic index is often used in the diagnosis of cancer.

State the effect of cancer on cell division.

(1)

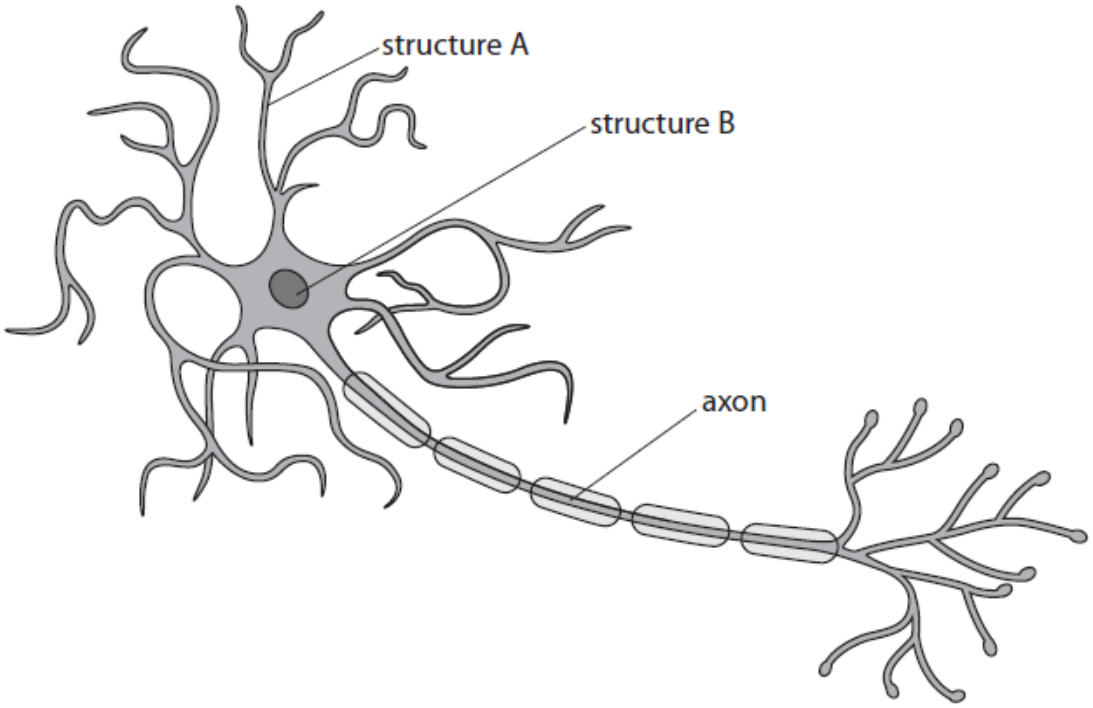
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(Total for question = 1 mark)

Q3.

Neurones form part of the nervous system.



(i) Name structures A and B.

(2)

structure A

.....

structure B

.....

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

The axon carries information along the neurone as

(1)

☒ **A** chemical messages

☒ **B** electrical impulses

☒ **C** neurotransmitters

☒ **D** hormonal responses

(iii) Describe the role of the myelin sheath surrounding the axon.

(2)

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(iv) There is a gap between neurones.

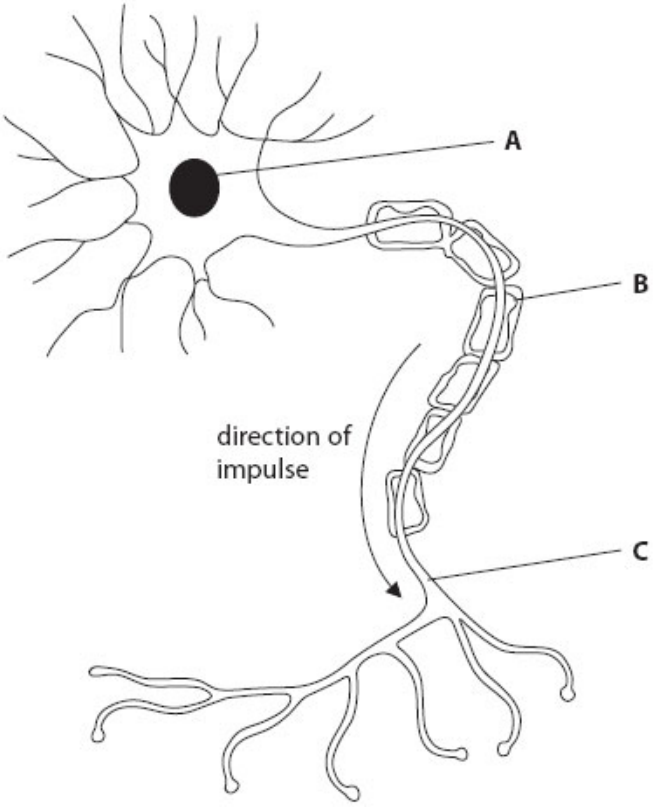
State the name for this gap between neurones.

(1)

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Q4.

The diagram shows a motor neurone.



A response can be affected by drugs.

The effect of drinking alcohol on reaction time was investigated using five adult volunteers A, B, C, D and E.

After drinking a number of units of alcohol, the reaction time for each volunteer was measured three times.

The results are shown in the table.

		Reaction time / ms				
Volunteer	**Number of units of alcohol drunk**	**1st attempt**	**2nd attempt**	**3rd attempt**	**Mean**	
A	0.5	34	38	27	33	
B	1.5	36	47	40	41	
C	3.0	59	62	59	60	
D	4.5	67	60	62		
E	6.0	80	68	83	77	

(i) Calculate the mean reaction time for volunteer D.

(2)

Answer ..... ms

(ii) Explain why alcohol causes a change in reaction time.

(2)

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Q5.

Transport and exchange of materials

Some students investigated water movement in plant cells.

They measured the mass of five pieces of potato.

Each piece of potato was put into a different concentration of salt solution.

After one hour the pieces of potato were dried and the mass of each was recorded.

The results are shown in the table.

concentration of salt solution / %	mass / g			percentage change / %
	start	after 1 hour	change	
0	10.2	13.1	+2.9	+28.4
10	9.8	11.4	+1.6	+16.3
20	10.3	9.8	–0.5	
30	10.1	8.9	–1.2	–11.9
40	9.7	7.7	–2.0	–20.6

(a) (i) Calculate the percentage change in the mass of the potato in the 20% salt solution.

(2)

..... %

(ii) Suggest why calculating a percentage change is more useful than calculating the change in mass in this investigation.

(1)

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(b) Mitosis occurs in plant cells during growth.

Describe the division of a cell by mitosis.

(3)

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*(c) Explain how active transport and diffusion provide a plant with named substances it needs for growth.

(6)

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(Total for question = 12 marks)

Q6.

The student observed 89 cells on the microscope slide.

Figure 4 shows the number of cells at each stage of the cell cycle.

stage of cell cycle	number of cells
Interphase	44
Prophase	12
Metaphase	6
Anaphase	18
Telophase	9

Figure 4

Use this equation to calculate the mitotic index for this slide.

$$\text{mitotic index} = \frac{\text{number of cells in mitosis}}{\text{total number of cells}} \times 100$$

Give your answer to three significant figures.

(3)

Mitotic index .....

(Total for question = 3 marks)