AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.2.2.7

Cancer

Past-paper questions

Tier	**Higher**
Question groups	**5**
Available paper years	**2018–2024**

Using this booklet

1. Answer the questions in order and show your working.
2. Original question numbers and marks are retained.
3. Print at actual size (100%) for measuring questions.
4. Use the companion answer booklet to check your work.

Name: _____ **Date:** _____

Whole questions are retained for context, so some parts assess other specification points. Current and legacy sources are labelled. Continue on extra paper if needed.

4.2.2.7 Cancer

Question 01

June 2018 | 8464/B/1H | Original Q2

0 2 Coronary heart disease (CHD) is a non-communicable disease.

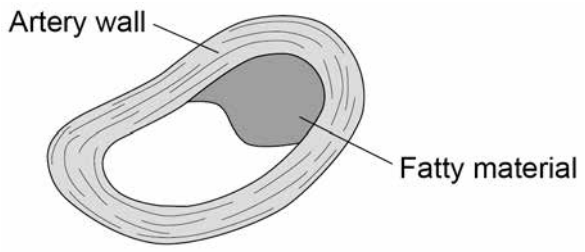
CHD is caused when fatty material builds up in the coronary arteries.

0 2 . 1 Explain what a non-communicable disease is.

[2 marks]

Figure 4 shows a coronary artery of someone with CHD.

Figure 4



0 2 . 2 Explain how CHD can cause a heart attack.

[3 marks]

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Question 01 · continued

0 2 . 3 Explain how lifestyle and medical risk factors increase the chance of developing CHD.
[6 marks]

11

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Question 02

June 2018 | 8464/B/2H | Original Q7

0 7 Many people eat shellfish called oysters.

An oyster has 20 chromosomes in each body cell.

0 7 . 1 Which arrangement of chromosomes will a male oyster have in each body cell?

[1 mark]

Tick **one** box.

- One X and one Y chromosome and 8 pairs of other chromosomes ☐
- Two X and two Y chromosomes and 8 pairs of other chromosomes ☐
- One X and one Y chromosome and 9 pairs of other chromosomes ☐
- Two X chromosomes and 9 pairs of other chromosomes ☐

0 7 . 2 Oyster gametes only contain half the amount of DNA compared to a normal oyster body cell.

Describe the type of cell division that produces gametes.

[3 marks]

Question 7 continues on the next page

Question 02 · continued

Biologists have discovered a way to produce oysters that have three sets of chromosomes (triploid) instead of the usual two sets (diploid).

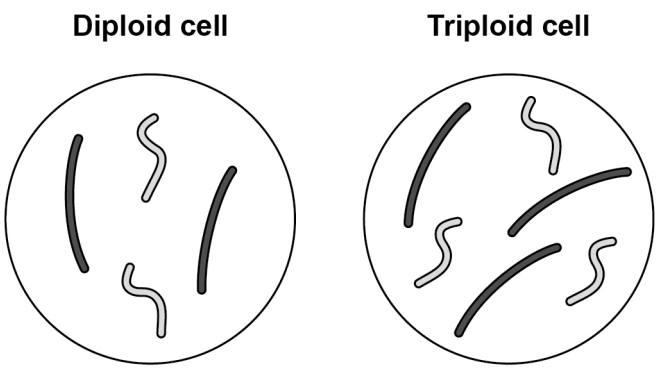
The triploid oysters cannot reproduce and so they grow more quickly.

Diploid oysters do not taste good in the reproductive season. Triploid oysters taste good all year.

Figure 5 shows the chromosomes in a diploid cell and in a triploid cell.

Only two sets of chromosomes are shown.

Figure 5



0 7 . 3 Suggest why the triploid oysters are **not** able to reproduce.

[1 mark]

0 7 . 4 Explain why the triploid oysters grow more quickly than the diploid oysters.

[2 marks]

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Question 02 · continued

0 7 . 5 The population of diploid oysters growing in the wild has reduced by over 80% in the last 20 years.

Suggest **two** environmental factors which may be causing this reduction.

Give a reason why each factor may be causing the reduction in the population.

[2 marks]

1 _____

_____

2 _____

_____

0 7 . 6 Oyster farmers grow the triploid oysters from young seed oysters.

The production of seed oysters involves the use of a chemical called cytochalasin B. Cytochalasin B has been shown to cause cancer in mice.

Evaluate the production of triploid oysters for supermarkets and restaurants.

[6 marks]

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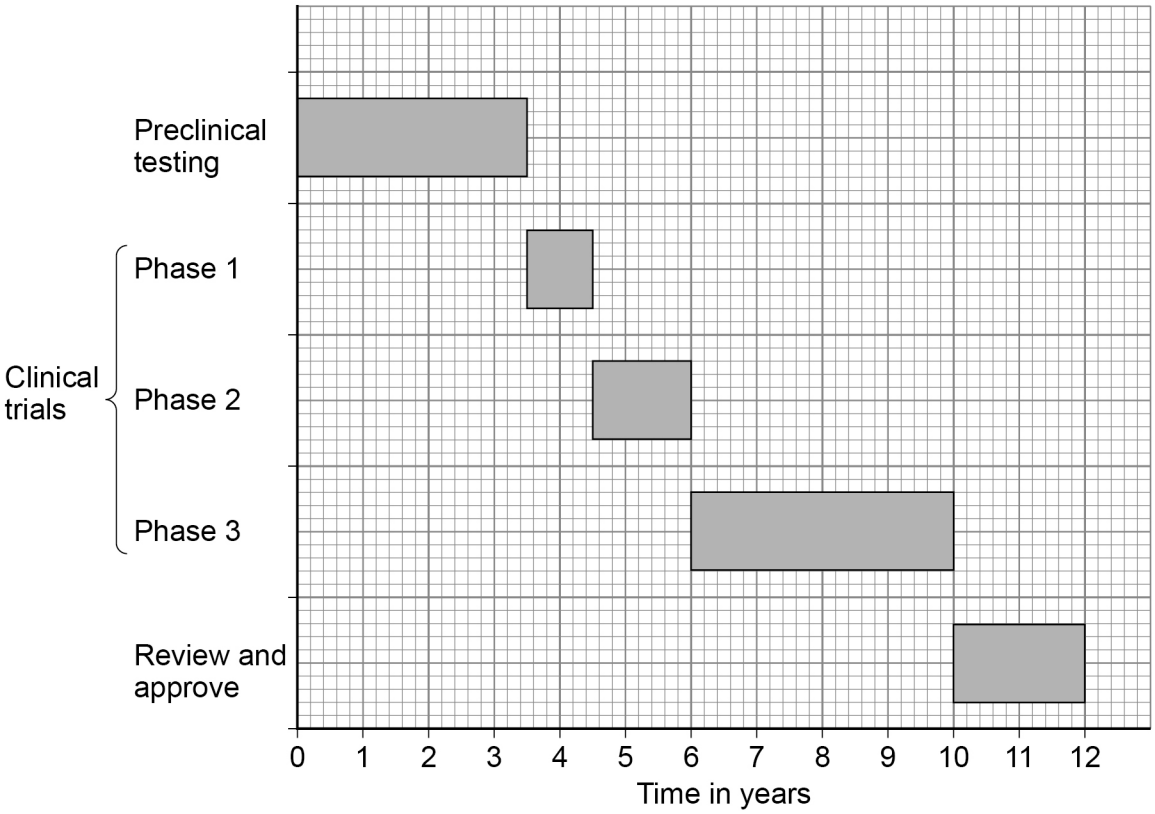
Question 03

November 2020 | 8464/B/1H | Original Q6

0 6 New drugs are tested and trialled before they can be licensed to treat patients.

Figure 6 shows how much time the different stages of testing took for one new drug.

Figure 6



0 6 . 1 How much more time did the clinical trials take compared with the preclinical testing?

[1 mark]

Tick (✓) **one** box.

- 3 years ☐
- 3.5 years ☐
- 5 years ☐
- 6.5 years ☐

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Question 03 · continued

During Phase 1 clinical trials low doses of the drug are tested on healthy volunteers.

0 6 . 2 Suggest **one** reason why **low doses** of the drug are used in Phase 1 clinical trials.

[1 mark]

0 6 . 3 Suggest **two** reasons why **healthy** volunteers are used in Phase 1 clinical trials.

[2 marks]

1

2

0 6 . 4 The results of clinical trials can only be published after peer review by other scientists.

Suggest **one** reason why the results must be reviewed by other scientists.

[1 mark]

Question 6 continues on the next page

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0 6 . 5 A drug is only licensed for the medical conditions it was tested to treat in the clinical trials.

Drug regulations:

- control what drugs a doctor can prescribe
- ensure doctors can prescribe a drug with confidence
- protect patients.

AMD is an eye condition that can result in very poor vision.

Doctors treat approximately 40 000 new cases of AMD each year.

Two drugs licensed to treat AMD in the UK are drug **A** and drug **B**.

In many other countries drug **C** is used to treat AMD. Drug **C** is only licensed in the UK to treat cancer.

The cost per injection for each drug is:

- drug **A** £561
- drug **B** £800
- drug **C** £28

The number of injections required to treat AMD is the same for each drug.

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Question 03 · continued

In 2018 the High Court in the UK gave permission for drug **C** to be used to treat AMD.

Evaluate the decision to allow the use of drug **C** to treat AMD in the UK.

[6 marks]

11

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Question 04

June 2022 | 8464/B/1H | Original Q5

0 5 This question is about tumours.

0 5 . 1 Describe the similarities and differences between benign tumours and malignant tumours.

[4 marks]

Question 5 continues on the next page

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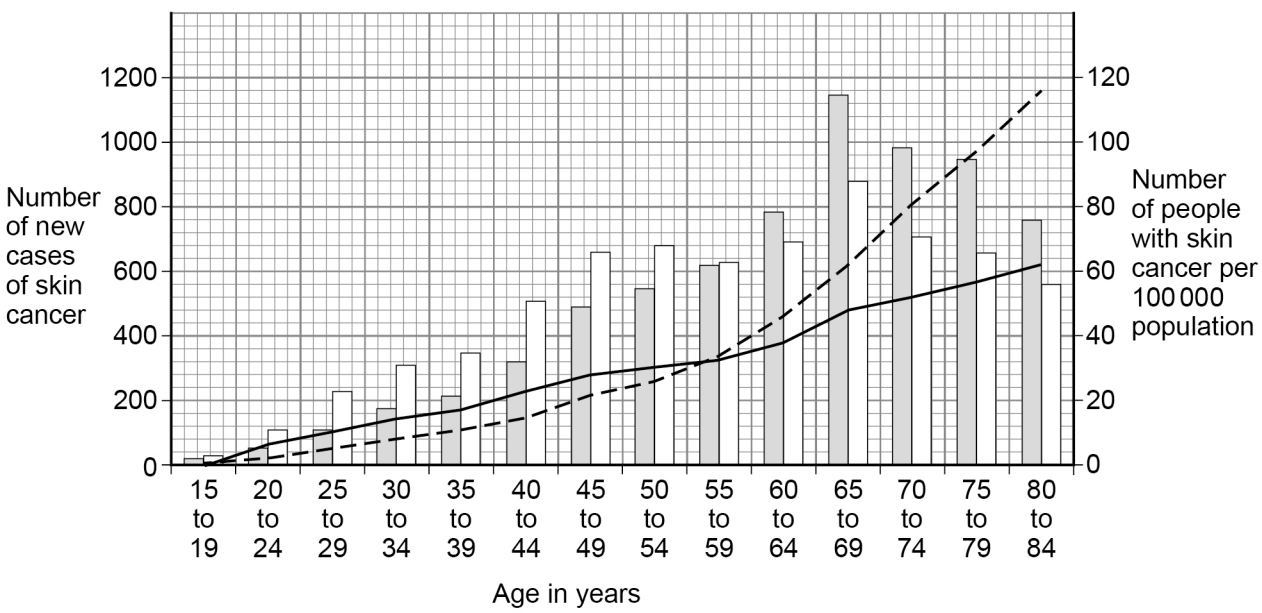
Question 04 · continued

Figure 10 shows data about skin cancer in males and females for different age groups in the UK.

It shows:

- the number of new cases of skin cancer in 1 year
- the number of people with skin cancer per 100 000 population in 1 year.

Figure 10



Key

New male cases

New female cases

Number of males with skin cancer per 100 000

Number of females with skin cancer per 100 000

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Question 04 · continued

0 5 . 2 There are no new cases of skin cancer diagnosed in people younger than 15 years of age.

Explain why.

[2 marks]

0 5 . 3 Give **two** conclusions about the number of **new cases** of skin cancer.

Use **Figure 10**.

[2 marks]

1

2

0 5 . 4 The data for the number of people with skin cancer is given per 100 000 population.

Suggest why the data is **not** given as the total number of people.

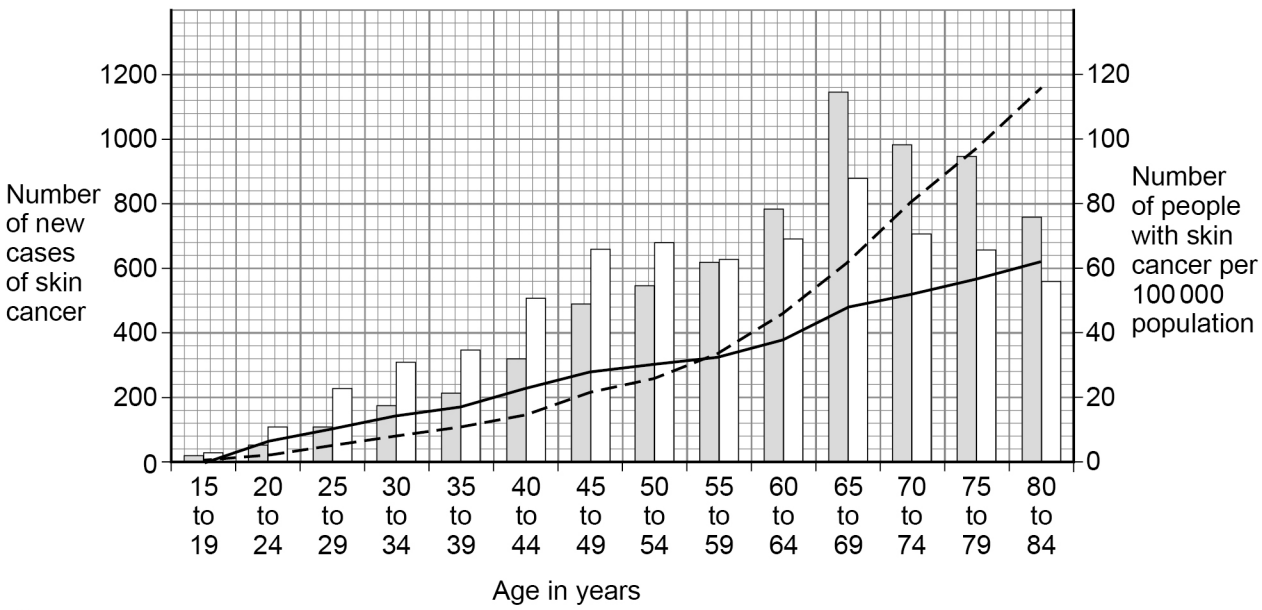
[1 mark]

Question 5 continues on the next page

4.2.2.7 Cancer

Figure 10 is repeated below.

Figure 10



Key

- New male cases
- New female cases
- – – – Number of males with skin cancer per 100 000
- —— Number of females with skin cancer per 100 000

0 5 . 5 Describe **two** trends shown in **Figure 10**.

Use **only** the data for the number of people with skin cancer per 100 000 population.

[2 marks]

1 _____

_____

_____

2 _____

_____

_____

4.2.2.7 Cancer

Question 04 · continued

0 5 . 6 The estimated population of males aged 80 to 84 years was 694 000

Calculate the number of males aged 80 to 84 years with skin cancer in that year.

Use **Figure 10**.

Give your answer to 3 significant figures.

[3 marks]

Number of males with skin cancer (3 significant figures) = _____

14

Turn over for the next question

4.2.2.7 Cancer

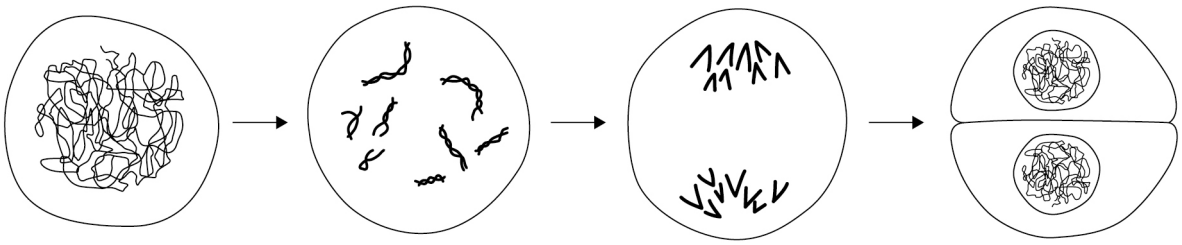
Question 05

June 2024 | 8464/B/1H | Original Q6

0 6 Smoking increases the risk of lung cancer.

0 6 . 1 **Figure 5** shows a lung cell dividing.

Figure 5



Describe the process of the cell cycle shown in **Figure 5**.

[4 marks]

4.2.2.7 Cancer

Question 05 · continued

0 6 . 2 Lung cancer is malignant.

Explain what is meant by a malignant tumour.

[3 marks]

Question 6 continues on the next page

4.2.2.7 Cancer

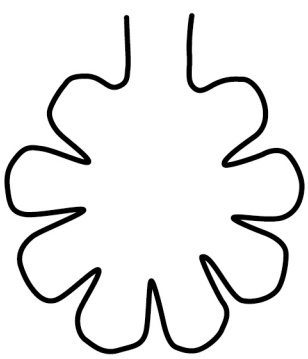
Question 05 · continued

0 6 . 3 Smoking can damage the lungs in different ways.

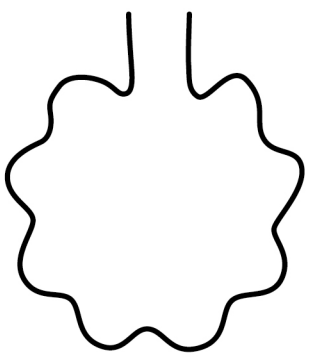
Figure 6 shows alveoli from the lungs of two people.

Figure 6

Person A
Alveolus from a person who does **not** smoke



Person B
Alveolus from a person who does smoke



Person **A** and person **B** do the same exercise.

Explain why person **B** breathes much faster than person **A** during the exercise.

[4 marks]

11