# End of topic quiz

# Topic B6: Global challenges

## Instructions and answers for teachers

These instructions cover the learner activity section which can be found on [page 11](#_Chapter:_P4_of). This end of topic quiz supports OCR GCSE (9–1) Combined Science A (J250), Topic B6.

**When distributing the activity section to the learners either as a printed copy or as a Word file you will need to remove the teacher instructions section.**

### The Activity

This end of topic quiz is a teaching and learning resource comprised of 40 marks covering a range of question types. The quiz starts with some multiple choice questions (MCQs) and them moves on to some short answer questions and then finally on to some longer answer questions.

This resource can be used to test and consolidate understanding at the end of teaching the topic or to revisit and refresh knowledge at a later point in the course.

### Learning Outcomes

This end of topic quiz relates to the specification learning outcomes in Topic B6: Global challenges. The questions in this quiz cover a range of the following topics:

B6.1 Monitoring and maintaining the environment

B6.2 Feeding the human race

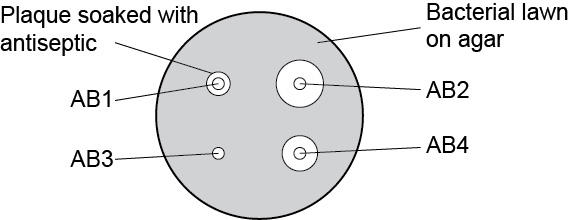
B6.3 Monitoring and maintaining health

### Topic: B6 of J250 - Answers

**Total marks: 40**

1. Antiseptics can be tested by comparing their effectiveness on a bacterial culture. **[1 mark]**

Look at the diagram below.



|  |  |  |
| --- | --- | --- |
| **A** | AB1 |  |
| **B** | AB2 |  |
| **C** | AB3 |  |
| **D** | AB4 |  |

Your answer

**B**

1. Patients with HIV are more likely to suffer from repeat infections.

This is because of a problem with a part of their blood.

Which part of their blood might be affected? **[1 mark]**

|  |  |  |
| --- | --- | --- |
| **A** | Plasma |  |
| **B** | Platelets |  |
| **C** | Red blood cells |  |
| **D** | White blood cells |  |

Your answer

**D**

1. Quadrats were used to estimate percentage cover in a grassland habitat.

The table shows the results.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Species percentage cover (%) | | | |
| Quadrat | Perennial rye-grass | Daisy | Dandelion | Clover |
| 1 | 84 | 3 | 2 | 12 |
| 2 | 82 | 5 | 8 | 5 |
| 3 | 75 | 8 | 12 | 10 |
| 4 | 95 | 0 | 3 | 3 |
| 5 | 93 | 1 | 3 | 4 |

What is the mean percentage cover for daisy? **[1 mark]**

|  |  |  |
| --- | --- | --- |
| **A** | 3.0% |  |
| **B** | 3.4% |  |
| **C** | 4.25% |  |
| **D** | 10.6% |  |

Your answer

**B**

1. Which infection has a causal link with cervical cancer? **[1 mark]**

|  |  |  |
| --- | --- | --- |
| **A** | Herpes simplex virus |  |
| **B** | Human immunodeficiency virus (HIV) |  |
| **C** | Human papilloma virus (HPV) |  |
| **D** | Tuberculosis |  |

Your answer

**C**

1. What is produced by lymphocytes in response to a pathogen? **[1 mark]**

|  |  |  |
| --- | --- | --- |
| **A** | Antibodies |  |
| **B** | Antigens |  |
| **C** | Phagocytes |  |
| **D** | Platelets |  |

Your answer

**A**

1. Kafue National Park is a nature reserve in Africa.

It is about the same size as the country of Wales.

The national park is home to a wide range of organisms including lions, elephants, hippos, antelope birds and tsetse flies.

Rhino have not been seen in the park since 1996.

|  |  |  |  |
| --- | --- | --- | --- |
| **(a)** | **(i)** | Why is it difficult to find out the number of each species living in Kafue National Park? **[1 mark]** | |
|  |  | big area/(animals) move about/can only sample/idea that densities vary in different parts of the park/reference to inaccessibility 🗸 | |
|  |  |  |  |
|  | **(ii)** | Devise a sampling technique to use to find out the number of tsetse flies in a habitat. **[3 marks]** | |
|  |  | **Any three from:**  use of nets/traps to catch the flies 🗸  count number in each sweep/trap 🗸  sample at different times/different locations 🗸  scaling up 🗸  use of pooter or description of capture-recapture 🗸  capture-recapture formula 🗸 | |
|  |  |  |  |
| **(b)** | **(i)** | Nikaye is an orphaned elephant.  When her herd ate villager’s crops on the edge of the national park they were chased away by the villagers.  Nikaye was left behind.  She was rescued and is being looked after in an elephant orphanage. When she is old enough she will be released back into Kafue National Park into an area protected by wildlife authorities.  Identify a positive and a negative human interaction in this case. **[2 marks]** | |
|  |  | *positive* – rescue / release / protection from wildlife authorities 🗸  *negative* – separating Nikaye / chasing elephants away 🗸 | |
|  |  |  |  |
|  | **(ii)** | What could be a possible reason for the human-elephant conflict? **[1 mark]** | |
|  |  | competing for land use/lack of food for elephants/fear of elephants/elephants eating crops 🗸 | |
|  |  |  |  |
|  | **(iii)** | Write down one other threat to elephants in Kafue National Park. **[1 mark]** | |
|  |  | hunting/poaching/loss of habitat 🗸 | |
|  |  |  |  |
|  | **(iv)** | What are the potential benefits to local people of increased biodiversity in the national park? **[2 marks]** | |
|  |  | **Any two from:**  employment in tourism 🗸  employment in wildlife protection 🗸  investment in local infrastructure/AW 🗸  able to observe wildlife 🗸  specific examples of infrastructure e.g. roads/schools 🗸 | |

1. Of the 56 million deaths in 2012 the World Health Organization (WHO) estimates 38 million were due to non-communicable disease (NCD).

|  |  |  |  |
| --- | --- | --- | --- |
| **(a)** |  | What percentage of deaths was due to non-communicable disease? **[1 mark]** | |
|  |  | 67.9% 🗸 | |
|  |  |  |  |
| **(b)** |  | What is meant by ‘non-communicable disease’? **[2 marks]** | |
|  |  | **Two from the following:**  idea not infections/cannot be spread 🗸  idea caused by interaction of a number of factors 🗸  relevant examples e.g. cardiovascular disease/cancer/respiratory disease/diabetes 🗸 | |
|  |  |  |  |
| **(c)** | **(i)** | The WHO also estimates 80% of non-communicable disease could be prevented.  How has an increased understanding of genetics helped prevent non-communicable disease? **[2 marks]** | |
|  |  | **Two from the following:**  idea of identify genetically susceptible 🗸  treat before symptoms/reduce risk factors 🗸  drugs targeted to genome 🗸 | |
|  |  |  |  |
|  | **(ii)** | The data shows the mean alcohol intake and the probability of dying from NCD globally and for some individual countries.   |  |  |  | | --- | --- | --- | | **Country** | **Mean alcohol consumption per person (arbitrary units)** | **Probability of dying from NCD between age 30 and 70 (%)** | | Egypt | 0.3 | 24.5 | | Zambia | 4.0 | 18.3 | | India | 4.6 | 26.2 | | USA | 9.0 | 14.3 | | Brazil | 9.1 | 19.4 | | Spain | 10.6 | 10.8 | | UK | 12.0 | 12.0 | | Australia | 12.6 | 9.4 | | Russia | 14.5 | 29.9 | | *Global* | *6.3* | *19.4* |   In which country are you least likely to die from non-communicable disease?  **[1 marks]** | |
|  |  | Australia 🗸 | |
|  |  |  |  |
|  | **(iii)** | Does the data support that alcohol causes NCD? **[3 marks]** | |
|  |  | idea that there are other factors (which also influence) not shown in this data 🗸  idea that partial data set/only shows some countries 🗸  no clear correlation 🗸  *yes because*  highest alcohol consumption has highest probability of NCD 🗸  *no because*  lowest alcohol consumption has high NCD 🗸  lowest NCD has second highest alcohol consumption 🗸 | |

1. Crops are altered to improve yields or provide disease or herbicide resistance.

|  |  |  |  |
| --- | --- | --- | --- |
| **(a)** | **(i)** | The bacterium *Agrobacterium tumafaciens* causes crown gall disease in plants.  Crown gall disease is a type of cancer.  What is cancer? **[2 marks]** | |
|  |  | changes in cells/changes in DNA/mutations 🗸  that lead to uncontrolled growth/division 🗸 | |
|  |  |  |  |
|  | **(ii)** | How is crown gall disease spread? **[2 marks]** | |
|  |  | EITHER  injury/damage to plant tissues 🗸  allows entry into plant 🗸  OR  bacteria lives in soil 🗸  plants replanted into (infected) soil 🗸 | |
|  |  |  |  |
|  | **(iii)** | The bacteria can also be used to genetically engineer plants.  Look at the diagram which shows this process.  Diagram: genetically engineering plants  What are **A**, **B** and **C**? **[3 marks]** | |
|  |  | A – restriction enzyme 🗸  B – sticky ends 🗸  C – ligase (enzyme) 🗸 | |
|  |  |  |  |
|  | **(iv)** | Outline **three** benefits of genetic engineering techniques like this one using *Agrobacterium tumerificans*.  Use the information in the diagram and your own knowledge to help you.  **[3 marks]** | |
|  |  | **Any three from:**  reduced use of herbicides 🗸  reduced use of pesticides 🗸  increase food production/yield 🗸  reduced risk of disease destroying crops 🗸  faster change than selective breeding 🗸 | |
|  |  |  |  |
| **(b)** |  | Crops can also be altered through selective breeding.  Compare the processes of selective breeding and genetic engineering. **[6 marks]** | |
|  |  | **Six from the following:**  both require a change in DNA/mutation (either from variation or from insertion) 🗸  both lead to a change in characteristics/phenotype 🗸  desirable characteristics are used in both 🗸  selective breeding takes a longer time/requires many generations of selection/ora 🗸  selective breeding requires the desired characteristic to be present within the species 🗸  genetic engineering can introduce new characteristics from another species 🗸  genetic engineering requires relatively new technology/wasn’t possible in the past/ora 🗸  more ethical issues with genetic engineering e.g. new species being created/insertion of genes which could be harmful to environment 🗸 | |

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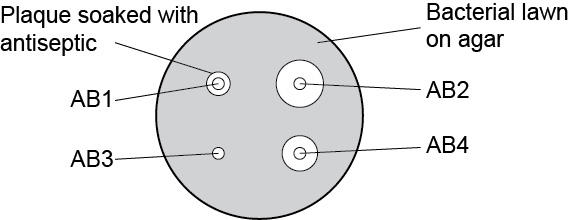
## Learner Activity

### Topic: B6 of J250

**Total marks: 40**

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Look at the diagram below.



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| **D** | AB4 |  |

Your answer

1. Patients with HIV are more likely to suffer from repeat infections.

This is because of a problem with a part of their blood.

Which part of their blood might be affected? **[1 mark]**

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|  |  | positive....................................................................................................................  ................................................................................................................................  negative..................................................................................................................  ................................................................................................................................ | |
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|  | **(iii)** | Write down one other threat to elephants in Kafue National Park. **[1 mark]** | |
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|  |  |  | |
|  |  |  |  |
|  | **(iii)** | Does the data support that alcohol causes NCD? **[3 marks]** | |
|  |  |  | |

1. Crops are altered to improve yields or provide disease or herbicide resistance.

|  |  |  |  |
| --- | --- | --- | --- |
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|  |  |  | |
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