OCR GCSE 21ST CENTURY BIOLOGY B · J257

BIOLOGY



EXAM QUESTION PACK

B2.3 HOW CAN WE PREVENT THE SPREAD OF INFECTIONS? (HIGHER)

SCORE	PERCENTAGE
/22	%

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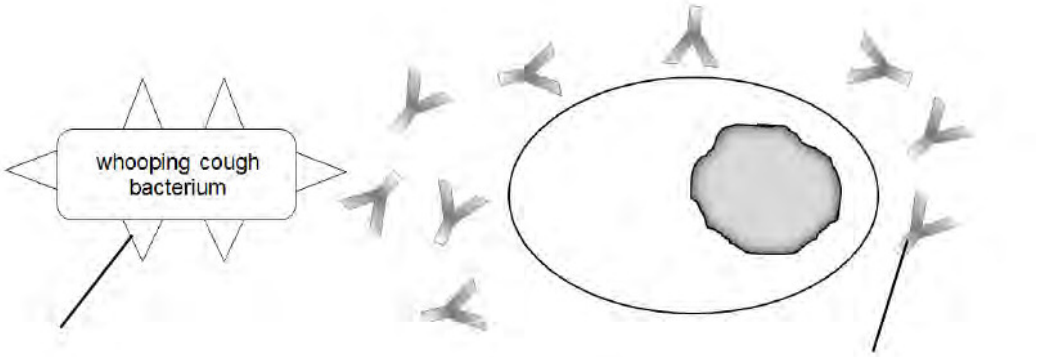
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1. Whooping cough is a non-communicable bacterial infection.

The diagram below shows the blood of a person infected with whooping cough.

Label the two structures in the diagram.



(i) .....

(ii) .....

[2]

(iii) People can be vaccinated against whooping cough.

There are two types of vaccine:
Type 1 uses whole bacterial cells
Type 2 uses parts of bacterial cells.

Some people are concernd about using the Type 1 vaccine with whole bacterial cells.

Suggest why.

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[1]

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2. Swelling of the aorta is called an aneurysm. An aneurysm is repaired by inserting a plastic tube called a stent into the aorta.

In 1990, the risk of death from this operation was 5.7%.

Explain the difference between **perceived** and **calculated** risk when patients decide whether or not to have the operation.

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[2]

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3. An outbreak of Ebola virus disease started in West Africa in 2013.

When the outbreak started, no drugs were known to cure the disease.

The table shows data from several countries.

The case fatality rate is calculated using the formula:

$$\text{case fatality rate} = \frac{\text{number of deaths}}{\text{number of cases}}$$

Country	Number of cases of Ebola	Number of deaths caused by Ebola	Case fatality rate
Guinea	2871	1876	0.65
Liberia	8478	3605	0.43
Mali	8		0.75
Sierra Leone	10 340	3145	0.30

(i) Calculate the number of deaths caused by Ebola in Mali.

Show your working.

answer = _____ [2]

(ii) Look at this news headline:

Ebola kills three out of every four infected people

Explain why the headline is **not** a good summary of the data.

_____

_____

_____

_____ [2]

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4(a). The MMR vaccination against measles, mumps and rubella is offered to babies in the UK when they are one year old.

In some years, fewer than 60% of parents in South Wales chose to vaccinate their babies.

Scientists think this may help to explain the shape of the graph in part **(a)**.

Put a tick (✓) in the boxes next to the **two** statements which, when put together, could explain the shape of the graph for people in South Wales.

There is more chance of coming into contact with an infected person.	☐
Measles is a potentially deadly disease.	☐
More people will have the antibodies for measles.	☐
A very high uptake of the MMR vaccine could eradicate measles forever.	☐
There are more people with the measles virus.	☐
Measles can be treated by antibiotics.	☐

[2]

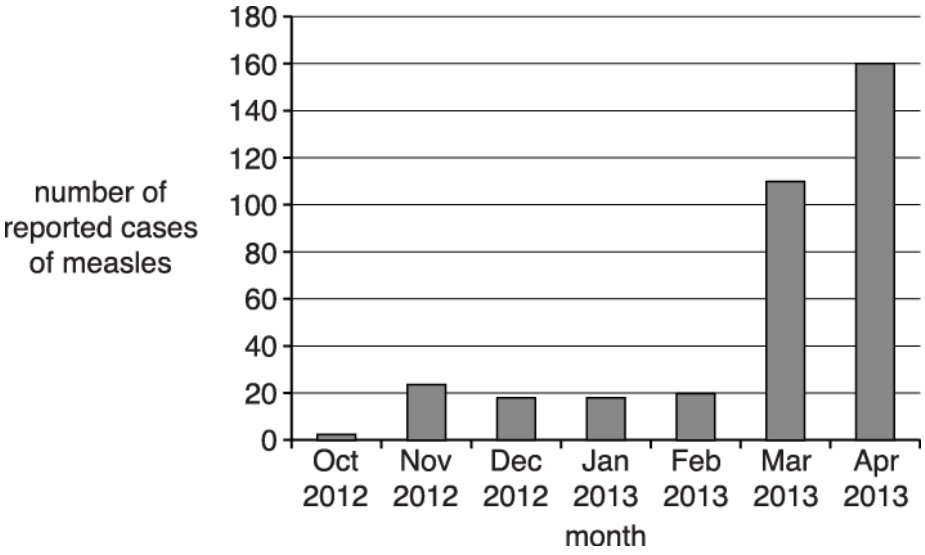
(b). Measles is a very infectious and potentially deadly disease.

It is caused by a virus.

The graph shows the number of measles cases reported in South Wales between October 2012 and April 2013.

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(i) Calculate the percentage increase in reported cases of measles in South Wales between February and April 2013.

Show your working.

_____ % **[2]**

(ii) This data is causing concern to doctors.

Explain why.

_____

_____

_____

_____

_____

_____ **[3]**

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(c). Hilary does not want to have her baby vaccinated against measles.



Hilary's friend has a high perception of risk associated with the MMR vaccine.

Explain why it is important for Hilary to consider the actual risk of the MMR vaccine rather than just listen to her friend.

---

[2]

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5. The female mosquito *Aedes aegypti* is responsible for the transmission of diseases such as Zika virus.

In May 2015, Zika virus was reported in Brazil and began to spread rapidly.

The mosquito feeds mainly on human blood. The virus is spread when a female *Aedes aegypti* mosquito bites an infected human and then bites an uninfected human.
Zika virus is a communicable disease.
Visitors to Brazil in 2016 were concerned that they could become infected with the virus.
There is no vaccination for this virus.

(i) Explain what a communicable disease is and suggest how a visitor to Brazil could reduce the risk of becoming infected with Zika.

---

[2]

(ii) The first ever human case of Zika was discovered in Nigeria in 1954. The timeline below shows how Zika spread.



The Zika virus can also be transmitted by sexual intercourse.

People were concerned that hosting the Olympic games in Brazil in 2016 would increase the spread of the virus to other countries.

Suggest how the virus could be spread to other countries **and** how this could be prevented.

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---[2]

END OF QUESTION PAPER

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