PEARSON EDEXCEL A-LEVEL BIOLOGY B · 9BI0

BIOLOGY



EXAM QUESTION PACK

TOPIC 6: MICROBIOLOGY AND PATHOGENS

OTHER PATHOGENIC AGENTS

SCORE	PERCENTAGE
/27	%

STEMUP

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Q1.

Malaria causes serious problems for pregnant women. They often suffer from a condition known as anaemia in which the ability of the blood to carry oxygen is significantly reduced.

Explain how malaria causes anaemia.

(2)

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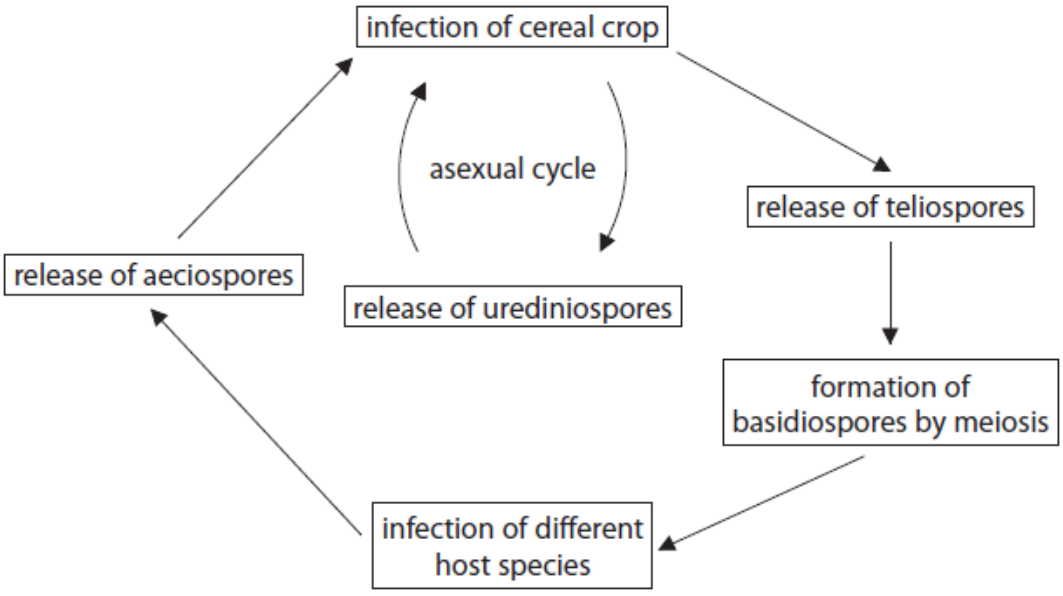
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(Total for question = 2 marks)

Q2.

The stem rust fungus is responsible for destroying cereal crops and reducing grain yield.

The diagram shows some stages in the life cycle of the stem rust fungus.



Explain how stem rust fungus results in a reduction in grain yield.

(3)

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(Total for question = 3 marks)

Q3.

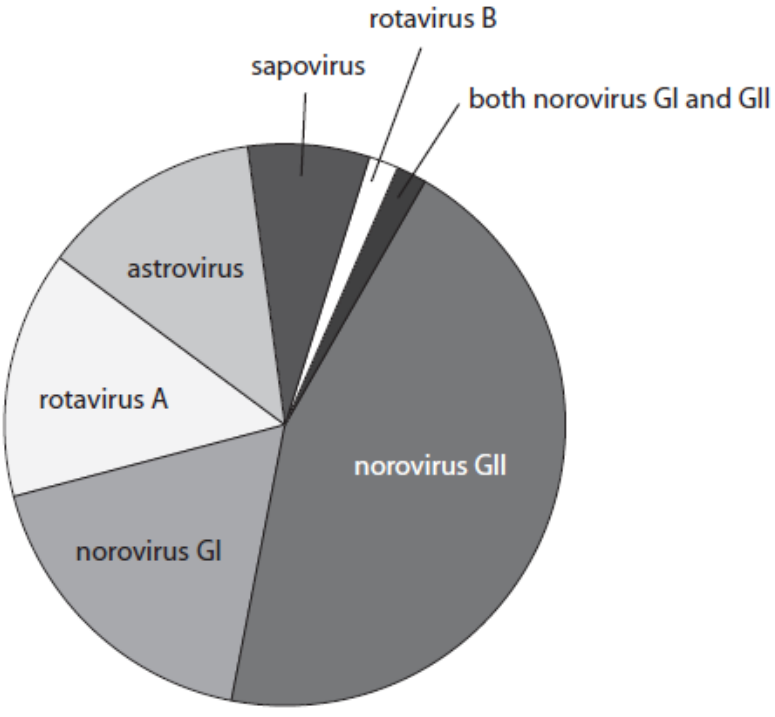
Norovirus is a single-stranded RNA, non-enveloped virus.

Norovirus is the most common cause of gastroenteritis.

One study into the causes of gastroenteritis involved 162 patients.

This study found that 24.7% of these gastroenteritis cases were caused by viruses.

The pie chart shows the proportion of the different types of virus identified as causing these gastroenteritis cases.



Estimate the total number of gastroenteritis cases caused by noroviruses.

(3)

Answer .....

(Total for question = 3 marks)

Q4.

Malaria is a serious and sometimes fatal disease.

Scientists are constantly looking for new ways of controlling this disease.

One group of scientists has genetically modified a fungus to produce a spider toxin that kills mosquitoes.

Another group of scientists has discovered a type of fungus that completely protects mosquitoes from infection by the pathogen that causes malaria.

This fungus does not kill the mosquitoes.

Explain why this approach is less controversial than the approach used by the scientists who are developing the genetically-modified fungus.

(3)

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(Total for question = 3 marks)

Q5.

Answer the question with a cross in the boxes you think are correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Mosquitoes transmit a number of diseases, including malaria.

The photograph shows a mosquito, *Anopheles gambiae*.

This mosquito transmits malaria.



Source: © Sinclair Stammers / Science photo library

(i) State the genus of this mosquito.

(1)

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(ii) Mosquitoes belong to the class Insecta.

Some of the insects in this class are subdivided into a group called Diptera.

What is the name of the classification group that includes Diptera?

(1)

☒ **A** Family

☒ **B** Genus

☒ **C** Order

☒ **D** Phylum

(iii) Which of the following organisms causes the symptoms of malaria?

(1)

☒ **A** *Anopheles gambiae*

☒ **B** *Plasmodium falciparum*

☒ **C** *Puccinia graminis*

☒ **D** *Salmonella enterica*

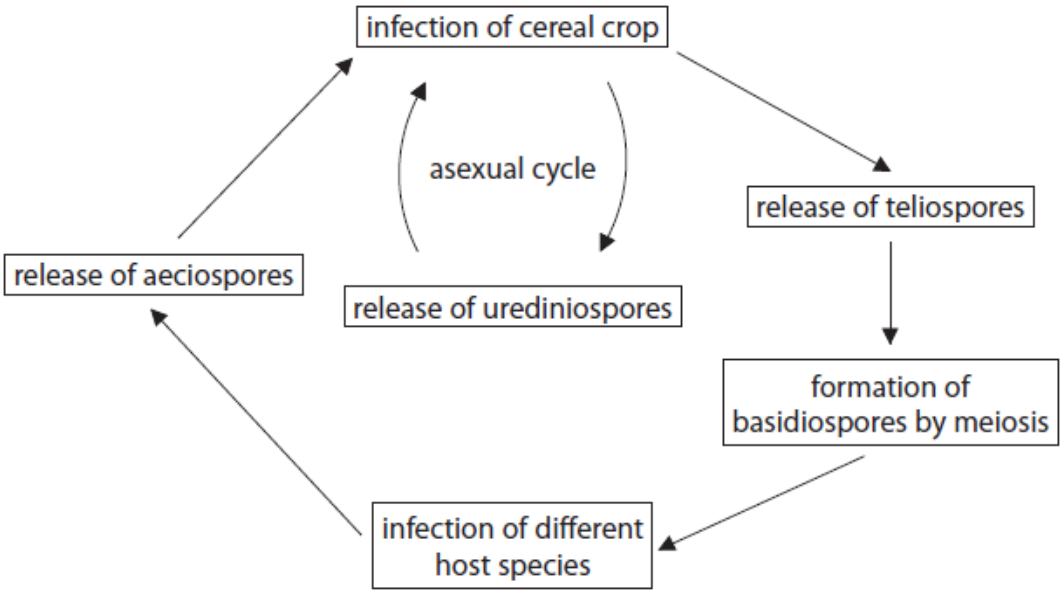
(Total for question = 3 marks)

Q6.

Answer the question with a cross in the box you think is correct ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

The stem rust fungus is responsible for destroying cereal crops and reducing grain yield.

The diagram shows some stages in the life cycle of the stem rust fungus.



Which genus does the stem rust fungus belong to?

(1)

☒ **A** Plasmodium

☒ **B** Puccinia

☒ **C** Salmonella

☒ **D** Staphylococcus

(Total for question = 1 mark)

Q7.

The classification of viruses is based on their structure and the type of nucleic acid that they contain.

(a) Which of the following is a reason why the influenza virus is classified as a retrovirus?

(1)

☒ **A** it has a capsid

☒ **B** it has an envelope

☒ **C** it contains RNA

☒ **D** it contains DNA

(b) Which of the following methods would be best for preventing the transmission of influenza through a population?

(1)

☒ **A** take paracetamol

☒ **B** wear a face mask

☒ **C** use insect repellent

☒ **D** take antibiotics

(c) Explain how the influenza virus has a pathogenic effect.

(4)

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(Total for question = 6 marks)

Q8.

The photograph below shows a mosquito net which is used in areas where malaria is common.



(Source: http://malarianomore.org.uk/news/uk-leads-fight-against-malaria-in-southern-sudan)

State **two** other methods that can be used to reduce the number of new cases of malaria.

(2)

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(Total for question = 2 marks)

Q9.

Malaria is a serious and sometimes fatal disease.

Scientists are constantly looking for new ways of controlling this disease.

Which row of the table shows the name of the pathogen that causes malaria, and its classification group?

(1)

	Name of pathogen	Classification group
☒ **A**	*Plasmodium*	genus
☒ **B**	*Plasmodium*	species
☒ **C**	*Puccinia*	genus
☒ **D**	*Puccinia*	species

(Total for question = 1 mark)

Q10.

Sickle cell anaemia is caused by a mutation in the β-globin gene which codes for part of haemoglobin.

The diagram shows the first 10 amino acids in this part of haemoglobin, in a healthy person and in a person with sickle cell anaemia.

Healthy person: val – his – leu – thr – pro – glu – glu – lys – ser - ala

Person with sickle cell anaemia: val – his – leu – thr – pro – val – glu – lys – ser – ala

People who are homozygous for the HbS allele develop sickle cell anaemia.

People who are heterozygous for HbS produce both forms of haemoglobin.
These individuals have some sickled red blood cells.

People with the HbS allele are less likely to get malaria.

You are provided with a blood sample from a patient with malaria and a blood sample from a healthy individual.

Devise a method that would allow you to distinguish between the two blood samples.

(3)

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