PEARSON EDEXCEL A-LEVEL BIOLOGY B · 9BI0

BIOLOGY



MARK SCHEME

TOPIC 6: MICROBIOLOGY AND PATHOGENS

OTHER PATHOGENIC AGENTS

SCORE	PERCENTAGE
/27	%

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Mark Scheme

Q1.

Question Number	Correct Answer	Additional guidance	Mark
	An explanation that makes reference to the following: • malarial {parasite/merozoite} {invades/destroys} red blood cells (1) • therefore reduced haemoglobin {red cell count} which causes anaemia (1)		**(2)**

Q2.

Question Number	Answer	Additional Guidance	Mark
	An explanation that makes reference to three of the following: • (stem rust) fungus {takes up / uses} {nutrients / glucose / amino acids} (1) • less {glucose to form starch / amino acids to form protein} (1) • (stem rust) fungus interferes with vascular tissue (1) • consequence of damaged vascular tissue (1)	ACCEPT glucose for respiration (by the plant) e.g. weakened stems , less magnesium ions for chlorophyll, less sucrose to transport to roots	

Q3.

Question Number	Answer	Additional Guidance	Mark
	• number of patients with gastroenteritis caused by viruses (1) • pie chart used to estimate proportion of cases caused by noroviruses (1) • total number of gastroenteritis cases caused by noroviruses (1)	Example of calculation: 162 × 24.7 ÷ 100 = 40 (40.014) 60 - 70 % 24, 25, 26, 27, 28 people Correct answer with no working gains full marks	(3)

Q4.

Question Number	Answer	Additional Guidance	Mark
	An explanation that makes reference to three of the following: • not unethical as mosquitoes not killed (1) • risk of other organisms being affected by the genetically-modified fungus is avoided (1) • organisms that feed on mosquitoes will not lose their food supply (1) • some people believe that modifying DNA is {wrong / unethical} (1)	**ACCEPT** converse for other approach e.g. toxins could harm other organisms, transfer of genes into other organisms **ACCEPT** unknown risks **ACCEPT** biodiversity maintained / ecosystems not disrupted / food chain not disrupted	(3) EXP

Q5.

Question Number	Answer	Additional Guidance	Mark
(i)	• *Anopheles*	**DO NOT ACCEPT** *Anopheles gambiae*	(1)CL

Question Number	Answer	Mark
(ii)	**The only correct answer is C Order** ***A** is incorrect because organisms in orders are sub-divided into families* ***B** is incorrect because organisms in families are sub-divided into a genus* ***D** is incorrect because organisms in phylum are sub-divided into classes*	(1)

Question Number	Answer	Mark
(iii)	**The only correct answer is B** *Plasmodium falciparum* ***A** is incorrect because Anopheles gambiae is the vector and not the pathogen* ***C** is incorrect because Puccinia graminis causes stem rust* ***D** is incorrect because Salmonella enterica causes food poisoning*	(1)

Q6.

Question Number	Answer	Additional Guidance	Mark
	B Puccinia	A is incorrect because Plasmodium is a protoctista that causes malaria C is incorrect because Salmonella is a bacteria that causes food poisoning D is incorrect because Staphylococcus is a bacteria that causes food poisoning	

Q7.

Question Number	Acceptable Answer	Additional guidance	Mark
(a)	C		**(1)**

Question Number	Acceptable Answer	Additional guidance	Mark
(b)	B		**(1)**

Question Number	Acceptable Answer	Additional guidance	Mark
(c)	An explanation that makes reference to the following: • virus can {bind to / infect} cells of {throat / lung} (1) • virus has {haemagglutinin / glycoprotein / receptors} (on its surface) (1) Plus two from: • detail of viral replication (1) • leads to cell {lysis / tissue} damage (1) • immune response is triggered which results in symptoms that include {fever / headaches / fatigue / sore throat} (1)		**(4)**

Q8.

Question Number	Correct Answer	Additional guidance	Mark
	An answer that makes reference to two of the following: • drain land to reduce mosquito larvae habitats (1) • use of mosquito repellent to prevent bites (1) • reduce mosquito population by use of insecticides (1)		**(2)**

Q9.

Question Number	Answer	Additional Guidance	Mark
	The only correct answer is A **B** is incorrect because *Plasmodium* is the genus name not the species name **C** is incorrect because *Plasmodium* causes malaria not *Puccinia* **D** is incorrect because *Plasmodium* causes malaria not *Puccinia*		(1) COMP

Q10.

Question Number	Acceptable Answer	Additional Guidance	Mark
	An answer that makes reference to the following: • a small volume of blood is spread into a very thin layer and viewed under a microscope (1) • blood is examined to look for the presence of the malarial parasite *Plasmodium* (1) • use of appropriate personal protective equipment when handling human blood samples (1)	Ignore references to sickled cells	**(3)**