1.3 Infection and Response: 30-minute Pack

AQA 8461 · Calculator allowed · about 30 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A school records cases of a contagious infection across three classes over one week: Class A 4 cases, Class B 1 case, Class C 5 cases.

(a) State which class had the fewest cases. **(1)**

(b) Calculate the total number of cases recorded that week. **(1)**

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(Total for Question 1 is 2 marks)

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2 Different pathogens cause different communicable diseases. For each disease below, identify the type of pathogen that causes it.

(a) Which type of pathogen causes Salmonella food poisoning? **(1)**

- ☐ A) Virus
- ☐ B) Bacterium
- ☐ C) Fungus
- ☐ D) Protist

(b) Which type of pathogen causes measles? **(1)**

- ☐ A) Virus
- ☐ B) Bacterium
- ☐ C) Fungus
- ☐ D) Protist

(c) Which type of pathogen causes malaria? **(1)**

- ☐ A) Virus
- ☐ B) Bacterium
- ☐ C) Fungus
- ☐ D) Protist

(d) Which type of pathogen causes rose black spot? **(1)**

- ☐ A) Virus
- ☐ B) Bacterium
- ☐ C) Fungus
- ☐ D) Protist

(Total for Question 2 is 4 marks)

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3 A medication trial measures how long a patient recovers from a bacterial infection with and without the new drug. The average recovery time without the drug is 10 days and with the drug is 6 days.

(a) Calculate the decrease in average recovery time when using the drug. **(1)**

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(b) State whether this result supports the drug being effective. **(1)**

(Total for Question 3 is 2 marks)

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4 A doctor prescribes antibiotics for a bacterial infection but not for a cold caused by a virus.

(a) Explain why antibiotics kill bacteria but not viruses. **(2)**

(b) Give one reason why a doctor will avoid giving antibiotics unless necessary. **(1)**

(Total for Question 4 is 3 marks)

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5 A lab measured how many bacteria were present in a sample at the start and after 2 hours at a warm temperature. At time 0 there were 100 bacteria. After 2 hours there were 400 bacteria.

(a) Calculate how many times larger the bacterial population became after 2 hours. **(2)**

(b) Give one reason why the population increased. **(1)**

(Total for Question 5 is 3 marks)

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6 An antiseptic is used to clean a surface to reduce microbes.

(a) Describe one key difference between an antiseptic and an antibiotic. **(1)**

(b) Give one example of where an antiseptic might be used. **(1)**

(c) State whether antibiotics are effective against viruses. **(1)**

(Total for Question 6 is 3 marks)

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7 Communicable diseases are caused by pathogens and can spread between organisms.

(a) Define the term 'communicable disease'. **(1)**

(b) State two ways that pathogens can be spread between people. **(2)**

(Total for Question 7 is 3 marks)

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8 Measles is a viral disease that mainly affects children in the UK, most of whom are vaccinated against it using the MMR vaccine.

(a) Name the type of pathogen that causes measles. **(1)**

(b) Describe two symptoms of measles. **(2)**

(c) Explain why most children in the UK are vaccinated against measles, even though most children who catch measles recover fully. **(2)**

(Total for Question 8 is 5 marks)

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Mark scheme · 1.3 Infection and Response: 30-minute Pack

Question 1

(a) Class B **B1**

(a) Answer: Class B.

(b) total = 4 + 1 + 5 = 10 **B1**

(b) Answer: 10 cases

Question 2

(a) B (bacterium) **B1**

(a) Answer: B

(b) A (virus) **B1**

(b) Answer: A

(c) D (protist) **B1**

(c) Answer: D

(d) C (fungus) **B1**

(d) Answer: C

Question 3

(a) 10 - 6 = 4 days decrease **B1**

(a) Answer: 4 days

(b) yes, the drug reduces recovery time, suggesting it is effective, oe **B1**

(b) Answer: Yes. Recovery time is reduced from 10 to 6 days, suggesting the drug is effective.

Question 4

(a) states that antibiotics target structures or processes specific to bacterial cells (cell wall, bacterial enzymes) not present in viruses **M1**

(a) antibiotics therefore do not affect viruses which replicate inside host cells and lack those bacterial targets, oe **A1**

(a) Answer: Antibiotics target features of bacterial cells such as cell walls or enzymes that viruses do not have; viruses replicate inside host cells and lack those targets, so antibiotics do not work on them.

(b) to reduce the risk of antibiotic resistance developing or to avoid unnecessary side effects, oe **B1**

(b) Answer: To reduce the risk of bacteria developing antibiotic resistance.

Question 5

(a) substitutes and calculates ratio: 400 / 100 = 4 **M1**

(a) population became 4 times larger cao **A1**

(a) Answer: 4 times larger

(b) correct reason: warm temperature, plenty of nutrients, or moist conditions that favour faster reproduction, oe **B1**

(b) Answer: Because the conditions were ideal, for example the warm temperature allowed faster reproduction.

Question 6

(a) antiseptics are applied to surfaces or skin to kill or reduce microbes externally; antibiotics are taken into the body to kill or inhibit bacteria internally, oe **B1**

(a) Answer: Antiseptics are used on surfaces or skin to kill or reduce microbes externally, while antibiotics are taken to treat bacterial infections inside the body.

(b) example such as cleaning a wound, disinfecting a table or surgical instrument, oe **B1**

(b) Answer: Cleaning a wound or disinfecting a surface.

(c) no, antibiotics are not effective against viruses cao **B1**

(c) Answer: No, antibiotics are not effective against viruses.

Question 7

(a) a disease that can be spread from one organism/person to another (oe) **B1**

(a) Answer: A disease caused by a pathogen that can be passed from one organism to another.

(b) any one correct method of transmission, e.g. direct contact **B1**

(b) any second correct method of transmission, e.g. water, air/droplets, contaminated food, animal vectors, bodily fluids/sexual contact **B1**

(b) Answer: Any two of: direct contact; contaminated water; air/droplet infection; contaminated food; animal vectors; bodily fluids.

Question 8

(a) virus **B1**

(a) Answer: Virus

(b) fever **B1**

(b) red skin rash (allow cough, red eyes) **B1**

(b) Answer: Fever and a red skin rash (any two accepted symptoms).

(c) measles can be fatal or cause serious complications, e.g. encephalitis (swelling of the brain) (oe) **B1**

(c) vaccination protects the individual and contributes to herd immunity, reducing spread to vulnerable people who cannot be vaccinated **B1**

(c) Answer: Although most children recover, measles can occasionally be fatal or cause serious complications; vaccination also reduces spread to those who cannot be vaccinated (herd immunity).

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