Answer Key

1	2	3	4	5	6	7	8	9	10
D	A	C	D	B	B	A	A	C	D

Question 11

(a) From day 10 to day 18.

(b) 14 days

(c) Antibiotics are used to treat bacterial infections by preventing the synthesis of cellular structures responsible for producing bacterial toxins, or even the reproduction of the bacteria itself. [1] Antibiotics will not recognise and bind to viruses that have protein capsids and spikes instead of the peptidoglycan cell wall of bacteria. [1]

Question 12

(a) Protein spikes. [1]
To recognise/attach to proteins on target/host cell surface membrane. [1]

(b) Viruses do not have organelles like mitochondria to release energy for metabolic processes. [1] Only after infecting a cell can the virus use the organelles of the host cell to release energy and synthesise proteins. [1]

(c) White blood cells recognise structure X from the vaccine and synthesise specific antibodies to damage the original viral pathogen. [1] When the virus mutates and structure X changes in shape/structure, white blood cells cannot recognise the new protein spike and the antibodies no longer attack the viral pathogen. [1]

Question 13

(a) Vaccines allow the immune system to target the specific viral pathogen more quickly and effectively once it enters the body. [1] A vaccinated person can still be infected by inhaling contaminated respiratory droplets from an infected person. [1]

(b) (i) Vaccines contain live and attenuated viruses / inactivated viruses / parts of the original virus [1] that mimic the structure of the pathogen to expose the immune system prior to exposure. [1]

(ii) White blood cells bind to the vaccine and synthesise specific antibodies that target and destroy the pathogen. [1] Should the person be infected with the actual pathogen in future, the white blood cells can synthesise the specific antibodies more quickly to deal with the infection, preventing the spread of the infection. [1]