**Question 31 [2016 Sem I Melville SHS Paper] (18 marks)**

Ebola Virus Disease, EVD, is a complex zoonosis that is highly virulent in humans. It was first detected in 1976, with the largest ongoing outbreak being in West Africa. Development of a marketable vaccine has yet to be achieved, with VSV-EDOV still in phase III of development.

1. Why can’t scientists grow Ebola in order to study it to make a vaccine? (1 mark)

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1. State three non-specific external defences that a human has and describe how they could prevent entry of the Ebola virus into the bloodstream. (3 marks)

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1. Viruses act in different ways to bacteria when they infect the human body. Describe how a pathogenic virus, such as Ebola, acts after entering the body to cause the disease.

(3 marks)

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1. To diagnose a person with Ebola, an antigen-capture detection test can be used.
2. What is an antigen? (1 mark)

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1. Explain why identifying the Ebola antigen could help the World Health Organisation develop a vaccine for Ebola. (1 mark)

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1. In recent outbreaks of Ebola some people have survived an infection and made a full recovery. This has occurred because their body has reacted by producing an antibody against the virus.
2. Describe three ways an antibody can work to provide resistance to infection.

(3 marks)

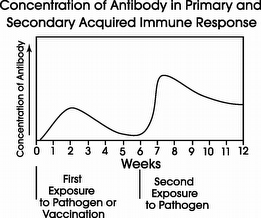
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1. State the type of immunity that occurs if a person who has Ebola is given antibodies directly into their blood stream. (2 marks)

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The graph below shows how the body responds to two successive infections of the same viral disease. Use this information to answer the next question.



<http://shawmst.org/biology/appendix/extended-responses/>

1. Using the information in the graph, discuss why it is unlikely that a person that has had Ebola and has recovered is unlikely to suffer from the disease again. (4 marks)

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