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

1. **Virus – not a living organism [needs a living host to function]** (1 mark)
2. (3 marks)

Any three, must include reason

* + **Skin – a barrier so cannot pass through unless cut**
  + **Mucus membrane – stick to mucus so cannot pass or enter cells**
  + **Hairs of nose/ears – mucus between hairs will trap virus**
  + **Cilia – beat virus away from cells**
  + **Ear wax/cerumen – virus will stick to so cannot pass**
  + **Flushing action – bladder/sweat/tears/saliva, wash virus away**
  + **Acids from stomach/vagina/skin can kill bacteria**
  + **Protective reflexes – vomiting/coughing/sneezing**
  + **Lysosomes in tears an enzyme that kills viruses**

1. (3 marks)

Any three points from:

* + **Bind to receptor site on a cell**
  + **Uncoated RNA from virus will enter cell**
  + **Virus makes a DNA copy of its RNA**
  + **Virus DNA mixes with host DNA**
  + **Host manufactures more viral RNA**
  + **New viruses then released**

d)

1. (1 mark)

Foreign protein or substance capable of causing a specific immune response

1. (1 mark)
   * **Once antigen identified, can modify it/attenuate it/create a sub-unit to create a vaccine**

OR

* + **Vaccines work by introducing the body to a harmless version of the antigen, if the antigen is unknown cannot create a vaccine.**
  + **OR – once identified vaccine can be made and given to many members**

– to reduce spread (Herd Immunity)

1. (i) (3 marks)

Any three ways

* + **Combine so inhibit reaction with cells**
  + **Bind to antigen so prevent entry into cells**
  + **Agglutinate so can be digested/cannot enter a cell**
  + **Dissolve antigen**
  + **Turn a soluble antigen into an insoluble antigen**
  + **Bind to virus surface preventing entry into cells**

(ii) (2 marks)

artificial (1)

passive (1)

1. Must mention memory cells and 3 other points from the following:

(4 marks)

* **First exposure [primary response] causes humoral response/antibody mediated response**
* **Production of memory cells**
* **if virus enters again memory cells recognise the virus/antigen quickly**
* **so the response is much quicker/plasma cells form very quickly**
* **antibody levels rise quickly in the plasma**
* **so destruction of the virus is quick preventing the person getting Ebola again/too quick for antigen to have any noticeable effect.**