1. Using your notes, the class website and your class textbook, answer the following. Highlight the command term.
2. Pick five questions and create original IB type questions indicate how many pieces of information will be required to be given to get full marks/ complete answer.
3. Define *pathogen*.

*“An organism or virus that causes disease.”*(1 p. 49)

1. List some examples of illness which are pathogenic and non-pathogenic.

Pathogenic:

Non-pathogenic:

1. Outline one example of an infection by each of the following types of pathogens:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| *Type of pathogen* | **BACTERIA** | **VIRUS** | **FUNGI** | **PROTOZOA** |
| Example disease | Cholera |  |  |  |
| Pathogen  | *Vibrio cholerae* |  |  |  |
| Method of transmission | Contaminated drinking water or food |  |  |  |
| Symptoms | Severe diarrhea and vomiting |  |  |  |
| Treatment | Urgent oral rehydration, antibiotics |  |  |  |
| Dangers  | Death by dehydration |  |  |  |

1. Explain why antibiotics can be used to treat bacterial infections but not viruses.

*Link thought: how does overuse of antibiotics lead to antibiotic resistance? There are plenty of references to this on the class website*

1. In the space below, draw and annotate two simple line graphs to distinguish between the action of *bacteriostatic* and *bacteriocidal* antibiotics:



*Link thought: how does overuse of antibiotics lead to antibiotic resistance?*

1. Outline the role of skin and mucous membranes in primary defense (acting as barriers against pathogens):

|  |  |
| --- | --- |
| Skin is a tough barrier |  |
| Hairs, e.g. nose |  |
| Mucous, such as in nose, airways |  |
| Acidic conditions (e.g. stomach and vagina) |  |
| Lysozymes |  |
| Natural organisms |  |

1. State the functions of the following components of the blood:

|  |  |
| --- | --- |
| Lymphocytes | Immune response – e.g. B-cells and T-cells |
| Phagocytic leukocytes (macrophages) |  |
| Erythrocytes |  |
| Platelets |  |
| Plasma |  |

1. Outline how phagocytic leukocytes ingest pathogens in the blood and body tissues.

|  |  |
| --- | --- |
| Method of membrane transport: |  |
| How does it work? |  |

1. Distinguish between antibodies and antigens.

|  |  |
| --- | --- |
| Antibody | A globular protein. *(revise levels of protein structure)*Produced as part of the immune response. Specific to the antigen on the pathogen – the antigen binding site is analogous to the active site of an enzyme.  |
|  |  |



*Link thought: how is this important in ABO blood typing and how is that an example of codominance?*

1. Explain how antibodies are produced.

|  |  |
| --- | --- |
|  | There are many different types of lymphocytes in the immune system.  |
|  |
|  |
|  |
|  |
|  |

*Link thought: antibodies are globular proteins produced by lymphocytes. Explain how the final antibody is produced from the genetic information in the lymphocyte nucleus, to a level of detail appropriate to your level of study.*

1. State the role of memory cells following an infection.
2. Define the terms HIV and AIDS

HIV =

AIDS =

1. Outline the effects of HIV on the immune system.

|  |  |
| --- | --- |
| Effect on lymphocytes |  |
| Effect on antibody production |  |
| Effect on health |  |

1. Discuss the cause, transmission and social implications of HIV/AIDS.

|  |  |
| --- | --- |
| Cause |  |
| Methods of transmission |  |
| Social implications |  |

1. Outline some of the economic impacts of HIV in the developing world.
2. The graph below shows the progression of a typical case of HIV. CD4 cells are those attacked by the HIV virus. Once levels of these lymphocytes drop below a critical value, the immune system is no longer able to fight infection and AIDS is diagnosed.



1. State the CD4 cell count at which AIDS is likely to be diagnosed.
2. Deduce, with a reason, the period in which a person infected with HIV is most likely to pass it on to someone else.
3. Describe the effects of HIV on the immune system over time.
4. Identify the period in which other illnesses are most likely to result in death.