**GENERAL HUMAN BIOLOGY – YEAR 12**

**TASK 10 –VACCINES, IMMUNOLOGY, COMMUNITY AND GLOBAL**

**HEALTH TEST**

**NAME: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ WEIGHTING: 10%**

**MARK: \_\_\_\_ / 40**

***MULTIPLE CHOICE [10 MARKS]***

Circle the correct answer

1. Antibiotics are often ineffective against viruses because viruses
   1. keep changing their external protein coat.
   2. are able to disguise themselves in the host cell membrane.
   3. are not true living cells, so their metabolism is not affected by antibiotics.
   4. can destroy or inhibit the actions of antibiotics in living cells.
2. Global hygiene standards are:
   1. The same around the world and include personal, medical, food and sanitation.
   2. Different around the world and include personal, medical, food and sanitation.
   3. The same around the world and include personal, food, vaccination and sanitation.
   4. Different around the world and include personal, food, vaccination and sanitation.
3. Which of the following is an example of passive natural immunity?
   1. The body manufactures antibodies in response to an invading pathogen.
   2. Antibodies enter the blood stream via an injection of antitoxin.
   3. The body manufactures antibodies after an injection of toxoids.
   4. Antibodies enter the blood stream from mother to foetus across the placenta.
4. Which of the following correctly states the difference between antibiotics and vaccines?
   1. Antibiotics treat for an invading bacterium, while many vaccines involve the introduction of an inactivated pathogen into the bloodstream.
   2. Antibiotics provide long-lasting immunity due to the production of memory cells, while vaccines only provide short-term immunity.
   3. Antibiotics provide artificial, active immunity, while vaccines provide artificial, passive immunity.
   4. Antibiotics are often injected into the bloodstream, while vaccines are normally ingested in pill form.
5. An example of specific immunity (Third line of Defense) is the
   1. action of mucus to remove bacteria from the respiratory tract.
   2. presence of 'natural flora’ bacteria in different areas of the body.
   3. presence of antibacterial agents, such as enzymes, in saliva.
   4. action of memory cells when an individual is subjected to a second infection of measles.
6. Which of the following statements best describes what is most likely to happen when an individual receives a vaccination containing a weakened pathogen? The ability to:
   1. fight the disease caused by the pathogen will increase due to antibody production.
   2. fight the disease will increase due to antibodies received from the pathogen.
   3. produce antibodies will decrease after vaccination.
   4. resist most types of diseases will increase.
7. The table lists the types of microbes identified in a cheeseburger prepared at an outdoor market.

|  |  |
| --- | --- |
| **Type of microbe** | **Description of microbe** |
| *Staphylococcus epidermidis* | Common skin organism, benign relationship with host |
| *Lactobacillus bulgari* | Organism present in dairy products, maintains gut health |

Would it be safe to eat this cheeseburger? Choose the best answer from the following.

* 1. No, food should be completely free of microbes
  2. No, Lactobacillus and Saccharomyces are highly pathogenic
  3. Yes, organisms that grow in or on the human body do not cause disease
  4. Yes, most of the food we eat is contaminated by different microbes

1. A superbug \_\_\_\_\_\_\_\_\_\_.
   1. Is not treatable through any form of antibiotics
   2. Results solely from immunity to treatments (i.e. antibiotics) in pathogens.
   3. Only occurs in specific strains or types of pathogens
   4. None of the above.
2. Which of the following factors influence the development, spread and treatment of bacteria derived superbug?
3. Overuse of antibiotics, remote areas, super antibiotics
4. Use of antibiotics, local transmission through vectors, super antibiotics
5. Underuse of antibiotics, global transmission, super antibiotics
6. Overuse of antibiotics, transmission in highly populated areas and improper use of antibiotics
7. Chloe becomes sick with an infectious disease that occurs annually in winter. Despite prescription of antibiotics, of increasing strength, she remains sick for a period of weeks after original infection. What type of pathogen has Chloe caught?
8. Salmonella
9. A minor bacterial infection
10. Common cold
11. A superbug

**End of Multiple-Choice**

***SHORT ANSWER (23 MARKS)***

1. Immunity can be classed as passive or active and natural or artificial. Complete the table below, describing the different types of immunity. (4 marks)

|  |  |  |
| --- | --- | --- |
|  | Passive | Active |
| Natural |  |  |
| Artificial |  |  |

1. The effects of many diseases have been minimised in many countries due to the introduction of live attenuated vaccines. A live attenuated vaccine uses a weakened version of the disease-causing pathogen to stimulate an immune response in the vaccinated person. The MMR (measles, mumps and rubella) vaccination program attracts a lot of media attention, which highlights some of the risks and ethical considerations associated with the use of vaccines.
2. Discuss **two** benefits and **two** risks for the use of vaccines. (4 marks)

**Benefits:**

**Risks:**

1. Vaccines are designed to work against specific microbes and can be produced in a number of ways.

Complete the following table on the different types of vaccines (6 marks)

|  |  |  |  |
| --- | --- | --- | --- |
| **Vaccine type** | **Description** | **Advantage** | **Disadvantage** |
| Live/ attenuated |  |  |  |
| Inactivated/  dead microbe |  |  |  |

1. “In Africa infectious diseases are the number one cause of death”. Create an argument stating why this statement is true in relation to the transmission of pathogen. (2 marks)
2. Australia and the United States of America are both first world countries. The FDA (Food Drug and Administration) in America has recently told Americans that they are taking antibacterial soaps off supermarket shelves for good.
3. Parents across agree that this is a good idea. Why do you think this is? (3 marks)
4. Do you think Australia should follow America in this case? Why/Why not? (4 marks)

**End of Short Answer**

***EXTENDED RESPONSE [7 MARKS]***

1. Below is a comparison of two (2) cities in the world.

|  |  |  |
| --- | --- | --- |
|  | **Perth (AUSTRALIA)** | **Rwanda (AFRICA)** |
| **Type of country** | First world country | Third world country |
| **Quality of hygiene standards** | High hygiene standards | Low hygiene standards |
| **Quality of sanitation standards** | High sanitation standards | Low hygiene standards |
| **Medication availability** | Lots of medication  (i.e. antibiotics). | Few types of medication  (i.e. antibiotics). |
| **Allergies in children** | Many allergies | Few allergies |
| **Immune system of children** | Hypersensitive/ react to many things | Normal immune functioning |

Answer the following questions on the lined paper at the end of this test.

1. There is a link between the number of allergies children have and the level of hygiene in their environment. What model / hypothesis is used to explain this link? (1 mark)
2. How might the difference between the number of allergies expressed by children of the two groups be explained using information about their hygiene OR sanitation? (3 marks)
3. Explain, using information from the table above, which group is more likely to develop a superbug and why? (3 mark)

**End of Test**