Unit 5 · Applied Biology

WORKSHEET

Full marks 44

Name _____ Class _____ Roll no. _____ Date _____ Marks _____ / 44

1 Key words [4]

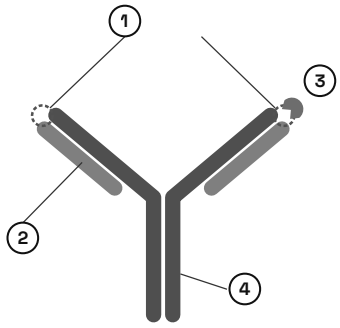
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

antigen	colostrum	goblet	histamine	immunoglobulins	keratin	lysozyme	pathogen	plasmid	toxoid

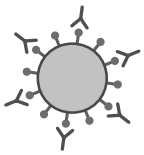
A living thing or a virus that causes disease is a _____. The tough protein in the dead cells of the skin is _____. The cells among the ciliated cells that make mucus are _____ cells. An enzyme in mucus, tears and saliva that breaks down the cell walls of many bacteria is _____. A molecule that the body recognizes as foreign and that starts an immune response is an _____. Antibodies are also called _____. A germ's toxin made harmless by chemicals is a _____. The first milk, rich in a mother's antibodies, is _____.

2 Label the diagram [2]

The diagram shows an antibody. Name the parts numbered 1 to 4. Each carries 0.5 mark.



4 chains in a Y; each kind of antibody fits one antigen

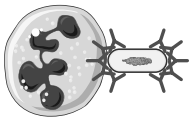


neutralizing blocks a virus



agglutination clumps germs

phagocyte



marking gets them eaten

1. _____ 2. _____

3. _____ 4. _____

3 Multiple choice [6]

Choose the correct option for each of the following questions.

i. Which of these is part of the first line of defense of the body? [1]

a. antibodies **b.** neutrophils
c. mucus in the nose **d.** memory cells

ii. The tiny hairs that sweep mucus up the windpipe are: [1]

a. villi **b.** cilia
c. flagella **d.** pseudopodia

iii. Which white blood cells are the most numerous, and first to arrive at an infection? [1]

a. neutrophils **b.** lymphocytes
c. eosinophils **d.** basophils

iv. The immunity a baby gets from its mother's milk is: [1]

a. natural active immunity **b.** natural passive immunity
c. artificial active immunity **d.** artificial passive immunity

v. Which of these is a toxoid vaccine? [1]

a. BCG **b.** oral polio vaccine
c. tetanus vaccine **d.** measles-rubella vaccine

vi. Penicillin was discovered in 1928 by: [1]

a. Edward Jenner **b.** Alexander Fleming
c. Élie Metchnikoff **d.** Selman Waksman

4 Match the columns [2]

Match each kind of vaccine with what it contains. One description in Column B is not needed. Each carries 0.5 mark.

Column A		Column B
1. live, weakened	☐	**a.** the germ's toxin, made harmless
2. killed	☐	**b.** ready-made antibodies from a horse
3. toxoid	☐	**c.** the living germ, which can't cause the disease in a healthy person
4. subunit	☐	**d.** the whole germ, not alive
		e. only one part of the germ

5 True or false [3]

Write T for a true statement and F for a false one. Correct each false statement. Each carries 0.5 mark.

i. The cilia of the windpipe push mucus down into the lungs. ☐

ii. Pus is mostly dead neutrophils. ☐

iii. Monocytes grow into plasma cells. ☐

iv. Passive immunity makes no memory cells. ☐

v. Antibiotics cure the common cold. ☐

vi. A vaccine is given to cure a disease that a person already has. ☐

6 Very short answers [3]

Write very short answers to the following questions.

a. Who tested the first vaccine, against smallpox, in 1796? [1]

b. What is the pH of the skin's surface, about? [1]

c. Which cells does HIV destroy? [1]

7 Short answers [8]

Write short answers to the following questions.

a. Give a reason: smokers often suffer from a cough and chest infections. [2]

b. Give a reason: pus forms in an infected wound. [2]

c. Write any two differences between active and passive immunity. **[2]**

d. Why do antibiotics harm bacteria but not viruses? **[2]**

8 Long answers **[10]**

Write long answers to the following questions.

a. What is phagocytosis? Describe its steps. **[6]**

b. What is immunity? Describe the kinds of acquired immunity with an example of each. **[4]**

9 Working it out [3]

Solve the following problem. Show your working.

Chickenpox has an R_0 of about 10. A school has 800 students. At least how many of them must be immune to stop chickenpox spreading through the school?

Answer: _____

10 Think [3]

Pemba cut his hand on a rusty nail in a cowshed. At the health post he was given an injection of anti-tetanus serum (ready-made antibodies) and his first dose of the tetanus vaccine. Why both? Which kind of immunity does each give?

11 Activity: What a sticky surface catches (not marked)

Smear petroleum jelly over one clean glass slide and leave another clean. Put both side by side, out of the rain, by a dusty road or window for one day. Count the specks in a 1 cm square of each with a hand lens, then tip each slide and blow gently. Wash your hands afterwards.

Slide	Specks in 1 cm^2	Specks left after tipping and blowing
sticky		
dry		

Which part of your airways is like the sticky slide? What carries away what it catches?