Answers to end-of-chapter questions
Chapter 10: Pathogens and immunity

1 pathogen, viruses, protoctists, fungi (*these last three in any order*), hydrochloric acid, keratin, clotting, mucus

2 **a** active immunity

b passive immunity

c antigens

d phagocyte

e lymphocyte

f memory cell

g active immunity

h antibody

3 **a** **i** chemical / protein, made by a lymphocyte;
made in response to an antigen;
reference to the antibody being specific to the antigen; **[max 2]**

ii person R has been given antibodies;
has not made their own antibodies;
has not made memory cells;
antibodies are gradually broken down; **[max 2]**

iii takes time for lymphocytes to respond to antigen;
by dividing / forming a clone;
and secreting antibodies; **[max 2]**

b passive;
natural; **[2]**

4 **a** fluctuated / went up and down;
peaks approximately every 2 or 3 years;
no general increase or decrease;
fluctuations become smaller in later years;
highest incidence is 760 thousand cases in 1956; **[max 3]**

b after an outbreak many people have developed immunity;
so fewer people get the disease in the following years;
new outbreak if the virus spreads to a new area;
or infects young children (who have not had the disease before); **[max 2]**

c the number of cases fell from 460 thousand cases a year to 20 thousand cases a year;
in 4 years;
cases remained low;
cases almost zero by 2004; **[max 2]**

d if 90 % of people are vaccinated there are few people in which the virus can reproduce;
so fewer viruses circulating in the population;
reduces chances that an unvaccinated person will come into contact with the virus; **[max 2]**

5 **a**

Method	Type of immunity
having a disease and recovering from it	active
feeding a baby on breast milk	passive
being injected with antibodies	passive
receiving a measles vaccination as a child	active

one mark for any two correct; **[2]**

b antibodies provide immediate protection;
vaccinating with weakened pathogens would stimulate lymphocytes to make antigens;
but this would take too long;
she might be infected before her body has made its own antibodies; [4]