

32 Disease - transmission and control - answers

1 Transmissible: whooping cough, food poisoning, tuberculosis, measles, syphilis, influenza, AIDS.

Non-transmissible: lung cancer, rickets, arthritis, appendicitis, diabetes, anaemia, coronary heart disease, haemophilia.

2 (a) (i) Droplets come from the respiratory passages (bronchi, trachea, nose) and the mouth.
(ii) Droplets might contain bacteria or viruses.

(b) Examples of infections spread by droplets are tuberculosis, colds, influenza, measles, chicken pox (any two).

3 (a) Typhoid and cholera can be spread by contaminated water.

(b) The spread of such diseases can be prevented by (i) effective disposal of sewage,
(ii) purification of drinking water.

4 Food may become contaminated (i) from the unwashed hands of a food-handler, (ii) by house-flies or blowflies walking over it, (iii) by infected droplets or dust particles landing on it.

5 (d) Although smoking while preparing food is indicative of a slovenly attitude, there is little risk of its contaminating food. Tobacco ash would be sterile.

6 The most likely order of events is as follows:

- (c) Kitchen worker has intestinal disease.
- (a) Pathogenic bacteria present in intestine.
- (e) Pathogenic bacteria in faeces.
- (h) Faeces expelled in lavatory.
- (g) Hands not washed after defecation.
- (b) Unwashed hands prepare food.
- (f) Pathogenic bacteria get into food.
- (i) Food ingested by healthy people.
- (d) Outbreak of food poisoning.

Note: (e) and (h) are interchangeable.

7 The most appropriate description of a contagious disease is (c), one which is spread by contact with an infected person (or, in fact, clothing or towels etc. used by infected persons).

8 In the air passages, a layer of *mucus* (A) traps bacteria. This *mucus* (B) is carried away from the lungs by the action of the *ciliated* (C) cells which line the air passages.

9 The *cornified* (A) layer of the skin is a barrier to the entry of bacteria. Also the *sweat* (B) glands and *sebaceous* (C) glands produce bacteriocidal substances. If bacteria get through damaged skin, they are attacked by *white cells* (D) and *antibodies* (E) in the blood.

10 The gauze masks worn by surgeons prevent infected droplets from reaching the patient.

11 (a) Water most likely to contain pathogenic bacteria will be that which receives untreated or partially treated sewage.

(b) Water least likely to be contaminated will be that which comes from unpopulated areas or has filtered through rock layers into underground aquifers.

Disease - transmission and control - answers (continued)

12 The correct sequence is as follows: (e) Course screen. (b) Settling tank.
(d) Slow sand filter. (a) Chlorination plant. (c) Water tower.

13 Unless all flies are swatted before they can land on food, this is not an effective way of preventing contamination.

14 In many cases, when you catch an infectious disease, your blood produces *antibodies* (A) against the infective organism. These *antibodies* (B) remain in the blood or can be rapidly made so that you are *immune* (C) to further attacks of the disease.

You can acquire *immunity* (D) by receiving injections of a *harmless* (E) form of the pathogen or its inactivated *toxin* (F). The injected substance is called a vaccine (G).

15 Rubella, tuberculosis, polio, measles, mumps and tetanus can be prevented by inoculation.

16 (a) tuberculosis ----- (iv) harmless form of bacteria
(b) whooping cough -- (iii) killed bacteria
(c) diphtheria ----- (ii) inactivated toxin
(d) polio ----- (i) harmless form of virus.

17 Antiseptics and disinfectants both kill *bacteria* (A) but only *antiseptics* (B) are safe to use on the skin (if sufficiently dilute).

18 An ideal *drug* (A) against infectious disease would be one which destroyed the *pathogen* (B) but did not harm the *host* (C).

19 There is insufficient evidence to support a claim that the syrup cured the cough. The cough might have got better without any treatment at all.

20 (a) Salmonella bacteria are most likely to be present in poultry (chicken, duck, turkey), eggs, beef or pork, and unpasteurised milk.
(b) *Salmonella typhimurium* causes food poisoning.
(c) Cooking usually kills Salmonella bacteria in food.

21 Resistant bacteria are resistant to drugs, particularly antibiotics.

22 (b) A cooked chicken leg straight from the refrigerator is unlikely to contain Salmonella bacteria. Cooking should have killed the bacteria and refrigeration should have prevented the reproduction of any bacteria which survived the cooking.

23 (a), (b) and (c) are not recognised ways in which syphilis or gonorrhoea can be transmitted.

24 (a) During birth, a baby may become infected with gonorrhoea bacteria as it passes through the vagina of an infected woman.
(b) Syphilis bacteria can pass through the placenta and infect the fetus before birth.

25 The malarial parasite attacks red blood cells.

26 The malarial parasite is transmitted when a healthy person is bitten by a mosquito which has fed on an infected person.

27 (a) Anti-malarial drugs do not kill the parasites in the liver.
(b) The mosquitoes became resistant to the DDT insecticide.

32 Disease - transmission and control

- 1 Classify the following diseases under the headings 'Transmissible' and 'Non-transmissible'.
lung cancer, whooping cough, rickets, arthritis, appendicitis, food poisoning, tuberculosis, measles, diabetes, anaemia, syphilis, influenza, AIDS, coronary heart disease, haemophilia
- 2 (a) In droplet infection (i) where do the droplets come from, (ii) what infective agents might they contain?
(b) Give two examples of diseases normally spread by droplets.
- 3 (a) Give two examples of diseases which can be spread by contaminated drinking water.
(b) How can the spread of such diseases be prevented?
- 4 Suggest three ways in which food might become contaminated by harmful bacteria.
- 5 Which one of the following is least important in preventing the contamination of food?
(a) Keeping food away from flies.
(b) Washing the hands before preparing food.
(c) Not coughing or sneezing over food.
(d) Not smoking while preparing food.
- 6 The following events explain an outbreak of food poisoning in a factory canteen. Put the events in the appropriate order.
(a) Pathogenic bacteria in intestine.
(b) Unwashed hands prepare food.
(c) Kitchen worker has intestinal disease.
(d) Outbreak of food poisoning.
(e) Pathogenic bacteria in faeces.
(f) Pathogenic bacteria get into food.
(g) Hands not washed after defecation.
(h) Faeces expelled in lavatory.
(i) Food ingested by healthy people.
- 7 Which one of the following is the most appropriate description of a contagious disease?
A contagious disease is one which is spread by
(a) contaminated food,
(b) contaminated drinking water,
(c) contact with an infected person,
(d) droplets from an infected person.
- 8 In the air passages, a layer of (A) traps bacteria. This (B)is carried away from the lungs by the action of(C)cells which line the air passages.
- 9 The (A) layer of the skin is a barrier to the entry of bacteria. Also the(B) glands and (C) glands produce bacteriocidal substances. If bacteria get through damaged skin they are attacked by (D)and (E)in the blood.
- 10 What is the purpose of the gauze mask worn by surgeons during an operation?
- 11 What sources of water are (a) most likely, (b) least likely to contain pathogenic bacteria?

Disease - transmission and control (continued)

12 Put the following in the correct order for a water purification plant.

- (a) Chlorination plant.
- (b) Settling tank,
- (c) Water tower.
- (d) Slow sand filter.
- (e) Coarse screen.

13 Which one of the following is least likely to prevent contamination of food by houseflies?

- (a) A well-fitting dustbin lid.
- (b) Swatting flies.
- (c) Covering food with cling-film.
- (d) Efficient sewage disposal.

14 Complete the following sentences by selecting the appropriate words from the list below.

In many cases, when you catch an infectious disease, your blood produces (A) against the infective organism. These (B) remain in the blood or can be rapidly made so that you are (C) to further attacks of the disease. You can acquire (D) by receiving injections of a (E) form of the pathogen or its inactivated (F) The injected substance is called a (G)

immune, immunity, pathogens, disease, vaccine, antibodies, toxin, harmless, antigens

15 Which of the following diseases can be prevented by inoculation?

rubella, syphilis, tuberculosis, polio, gonorrhoea, common cold, measles, haemophilia, mumps, tetanus, AIDS

16 Match each disease with its correct type of vaccine.

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|--------------------|---------------------------------|
| (a) tuberculosis | (i) harmless forms of virus |
| (b) whooping cough | (ii) inactivated toxin |
| (c) diphtheria | (iii) killed bacteria |
| (d) polio | (iv) harmless form of bacteria. |

17 Antiseptics and disinfectants both kill (A) but only (B) are safe to use on the skin (if sufficiently dilute).

18 Complete the following sentence, selecting the most appropriate words from the list below.

An ideal (A) against an infectious disease would be one which destroyed the (B) but did not harm the (C)

pathogen, host, drug

19 A person with a cough takes a patent cough syrup. In three days, the cough is better. Does this mean that the syrup has cured the cough? Justify your answer.

- 20** (a) What kind of food is most likely to contain *Salmonella* bacteria?
(b) What illness is caused by *Salmonella typhimurium* ?
(c) What is the usual method of killing *Salmonella* bacteria in food?
- 21** When a particular strain of bacteria is called 'resistant', what is it resistant to?
- 22** Which one of the following is least likely to give rise to food poisoning?
(a) Cooking and eating a partially defrosted turkey.
(b) Eating a cooked chicken leg straight from the refrigerator.
(c) Preparing a fresh chicken for the oven and immediately making a lettuce and tomato salad.
(d) putting an uncooked chicken on the same plate as some cold ham.
- 23** Which of the following are not ways in which gonorrhoea and syphilis can be transmitted?
(a) Using a towel that has been used by an infected person.
(b) Touching an infected person.
(c) Kissing an infected person.
(d) Having sexual intercourse with an infected person.
- 24** How can a baby become infected with (a) gonorrhoea, (b) syphilis?
- 25** Which body cells are attacked by the malarial parasite?
- 26** By what means can malarial parasites be transmitted from an infected person to a healthy person?
- 27** (a) Anti-malarial drugs kill the parasites in the blood but they do not cure the disease. Why is this?
(b) Why was the use of DDT insecticide not successful in eradicating malaria?