Chapter 17. Aids To Health

Exercise 1

Solution A.

1. (c) An antibiotic
2. (c) Tetanus
3. (a) April 7

Solution B.1.

(a) Arsphenamine or Salvarsan
(b) Penicillin
(c) Passive acquired immunity
(d) Antiseptics – Lysol, iodine, boric acid and carbolic acid
Disinfectants – Cresol and phenol
Antibiotics – Ampicillin and penicillin
(e) Oral polio vaccine (OPV)

Solution B.2.

(i) Acquired Immuno Deficiency Syndrome
(ii) Bacillus Calmette Guerin
(iii) Diphtheria, Pertussis and Tetanus
(iv) World Health Organization

Solution B.3.

Antibodies are immunoglobulins which are produced in the blood to fight and destroy harmful microbes.

Solution C.1.

(a) False. Lysol is an **antiseptic**.
(b) True
(c) False. Our body can make an **unlimited variety** of different antibodies.
(d) False. Salk's vaccine is used against poliomyelitis.
(e) False. Treatment by the use of chemicals is known as chemotherapy.
(f) False. Selman Waksman coined the term 'antibiotic' for substances like penicillin.

Solution C.2.

(a) Antiseptic is a mild chemical substance which is applied to the body to kill germs, whereas an antibiotic is a chemical substance produced by a microorganism which can kill or inhibit the growth of some other disease-producing microorganisms.

(b) Antiseptic is a mild chemical substance which is applied to the body to kill germs, whereas a disinfectant is a strong chemical applied to spots or places on the body where

germs thrive and multiply.

(c) Disinfectant is a strong chemical applied to spots or places on the body where germs thrive and multiply, whereas deodorants are neither antiseptics nor disinfectants; they are aerosols used to mask a bad smell.

(d) Vaccination is the introduction of any kind of dead or weakened germs into the body of a living being to develop immunity (resistance) against a disease, whereas sterilisation is a process of eliminating or killing all the microbes present on a surface, contained in a fluid, in medication or in a compound such as biological culture media.

(e) Active immunity is the immunity developed by an individual due to a previous infection or antigen which enters the body naturally, whereas passive immunity is the immunity provided to an individual from an outside source in the form of 'readymade' antibodies.

(f) Innate immunity is the immunity by the virtue of genetic constitutional makeup, i.e. it is inherited from parents. It is present in the body without any external stimulation or a previous infection, whereas acquired immunity is the resistance to a disease which an individual acquires during a lifetime. It may be the result of either a previous infection or from readymade antibodies supplied from outside.

Solution C.3.

(i) TAB vaccine for typhoid
(ii) BCG vaccine for measles
(iii) DTP vaccine for diphtheria, tetanus and whooping cough

Solution C.4.

(a) Lysol, benzoic acid, DDT, mercurochrome
Antiseptics. DDT is a wrong example for this category as it is a disinfectant which is not good for human skin.

(b) Formalin, iodine, lysol, phenol
Disinfectants. Iodine is a wrong example as it is an antiseptic.

(c) BCG, DTP, ATP
Vaccines. ATP is a wrong example as it is an energy carrier in the cells of all known organisms.(d) Tears, skin, nasal secretion, HCl (in stomach)
Germ-killing secretions. Skin is a wrong example as it is a protective mechanical barrier and prevents the entry of germs in our body.

Solution C.5.

Vaccine	Disease(s)	The Nature of Vaccine
TAB	1. Typhoid	2. Killed germs
Salk's Vaccine	3. Poliomyelitis	4. Killed germs
BCG	5. Tuberculosis	Living weakened germs

Vaccines for Measles	Measles	6. Living weakened germs
Cowpox Virus	7. Small pox	8. Living fully poisonous germs
Toxoids	9. Diphtheria	Extracts of toxins
	10. Tetanus	Secreted by bacteria

Solution C.6.

1. Innate immunity
2. Acquired immunity
3. Specific immunity
4. Active acquired immunity
5. Passive acquired immunity
6. Natural acquired active immunity
7. Artificial acquired active immunity
8. Natural acquired passive immunity
9. Artificial acquired passive immunity

Solution C.7.

1. Antibiotics have a wide use in medicine to fight infections.
2. Certain antibiotics are used as food preservatives, especially for fresh meat and fish.
3. Some antibiotics are used in treating animal feed to prevent internal infection.
4. Some antibiotics are used for controlling plant pathogens.

Solution C.8.

Merits of local defence systems:

1. Local defence systems start working instantaneously.
2. These systems are not dependent on previous exposure to infections.
3. They are effective against a wide range of potentially infectious agents.

Solution C.9.

Diphtheria is a serious bacterial infectious disease. It leads to cold, coughing, sneezing and, in severe cases if undiagnosed, it might result in heart failure or paralysis. Treatment includes a combination of medications and supportive care. The most important step is prompt intravenous administration of diphtheria toxoid which is made harmless. The harmless toxoid once administered in a patient's body triggers the production of antibodies against the pathogens causing diphtheria.

Solution C.10.

(a) Bleeding from a cut in the skin:

- In case of bleeding, raise the affected part to minimise blood flow.

- Wash the cut surface with clean water.
- Press the area with a piece of clean cotton and apply some antiseptic.

(b) A fractured arm:

- Lay the victim comfortably, loosen or remove the clothes from the affected part.
- Do not move the fractured part.
- If the affected limb is an arm, then tie a sling around the neck to rest the arm in it.

(c) Stoppage of breathing due to electrical shock:

- Lay the victim flat on the back and put a pillow or folded towel under the shoulders in a way that the chest is raised and the head thrown back.
- Hold and draw the arms upwards and backwards. This will cause the chest to expand and draw in air.
- Next, fold the victim's arms and press them against the ribs. The air will now be expelled.
- Repeat the two steps at the rate of about 15 times per minute. Continue till the victim starts breathing without any extra help or till the doctor arrives.

Solution D.1.

- Vaccination is the practice of artificially introducing germs or the germ substance into the body for developing resistance to particular diseases.
- Scientifically, this practice is called prophylaxis and the material introduced into the body is called the vaccine.
- The vaccine or germ substance is introduced into the body usually by injection and sometimes orally (e.g. polio drops).
- Inside the body, the vaccine stimulates lymphocytes to produce antibodies against the germs for that particular disease.
- Antibodies are an integral part of our immunity. Their function is to destroy the unwanted particles which enter the body.
- Vaccines give our immunity a signal to produce specific antibodies. Hence, the principle of vaccination is to produce immunity against a disease.

Solution D.2.

Whenever a germ or infection invades the body, a signal is sent to the immune system to produce specific antibodies. To cope with the number of germs being multiplied inside the body, white blood cells start multiplying rapidly. This enables them to produce more number of antibodies and stop the infection in time. So, abnormally large numbers of WBCs in the blood are usually an indication of some infection in our body.

Solution D.3.

(a) Antiseptics:

Antiseptics are mild chemical substances applied to the body which prevent the growth of some bacteria and destroy others.
Examples: Lysol and iodine

(b) Disinfectants:

Disinfectants are chemicals which kill microorganisms they come in contact with. Disinfectants are usually too strong to be used on the body.
Examples: Cresol and phenol

(c) Vaccines:

Vaccines are materials administered in the body to provide passive immunity. The materials are generally germs or substances secreted by germs.
Examples: OPV (oral polio vaccine) and DTP (diphtheria, tetanus and pertussis)