

Chapter 12 - Aids To Health

Exercise 1

Solution A.1.

(c) An antibiotic

Solution A.2.

(c) Tetanus

Solution A.3.

(c) April 7

Solution B.1.

- (a) Salvarson
- (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 Organisation

Solution B.3.

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

Solution C.1.

- (a) False
- (b) True
- (c) False
- (d) False
- (e) False
- (f) False

Solution C.2.

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

(b) Antiseptic is a mild chemical substance which, when applied on the body, kills germs whereas a disinfectant is a strong chemical, which is applied on spots and places on the body where germs thrive and multiply.

(c) Disinfectant is a strong chemical, which is applied on spots and 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 the respective disease or diseases whereas sterilization 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 his 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 his lifetime. It may be the result of either a previous infection or readymade antibodies supplied from outside.

Solution C.3.

1. TAB vaccine for typhoid
2. BCG vaccine for measles
3. 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 belongs to 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 used as 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. It prevents the entry of microorganisms at first place.

Solution C.5.

Vaccine	Disease (s)	The Nature of Vaccine
TAB	Typhoid	Killed germs
Salk's Vaccine	poliomyelitis	Killed germs
BCG	tuberculosis	Living weakened germs
Vaccines for Measles	Measles	Living weakened germs
Cowpox Virus	small pox	Living fully poisonous germs
Toxoids	Diphtheria	Extracts of toxins
	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.

(a) antibiotics have a wide use in medicine to fight infections.

(b) Certain antibiotics are used as food preservatives, especially for fresh meat and fish.

(c) Some antibiotics are used in treating animal feed to prevent internal infections.

(d) Some antibiotics are used for controlling plant pathogens.

Solution C.8.

Merits of the 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 administration of diphtheria toxoid which is made harmless is given intravenously. The harmless toxoid once administered in 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 minimize the 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 part fractured.
- 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 his back and put a pillow or folded towel under his shoulders in a way that his chest is raised and the head thrown back.
- Hold and draw his arms upwards and backwards. This will cause his chest to expand and draw the 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 the 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 the integral part of our immunity. Their function is to destroy unwanted particles entered in 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. In order to cope up 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 invade infection in time. Therefore, "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.

Example: Lysol and Iodine

(b) **Disinfectants:** Disinfectants are chemicals which will kill all micro-organisms they come in contact with. Disinfectants are usually too strong to be used on body.

Example: Cresol and Phenol

(c) **Vaccines:** Vaccines are the materials used to administer in the body to provide passive immunity. The materials are generally germs or the substances secreted by the germs.

Example: OPV (Oral polio vaccine) and DTP (Diphtheria, Tetanus and Pertussis)

Solution D.4.

First aid is the immediate care given to a victim of an accident, sudden illness or other medical emergency before the arrival of an ambulance, doctor or other qualified help.

(a) Little toe in the foot is pierced by a thorn and is bleeding:

- In the case of bleeding, raise the affected part to minimise gravitational outflow of blood.
- Wash the cut surface with clean water, press the area with a piece of clean cotton wool, and if possible, apply some mild antiseptic.

(b) An elderly woman walking on the footpath during a hot mid-day has fallen unconscious:

- Immediately lay the woman comfortably on a side of the road.
- Loosen the clothes.

- Let fresh air be around the woman.
- Give some fluids to drink to the woman.

(c) A young boy has burnt his finger tip while firing crackers:

- Immediately wash his burnt finger with sufficiently cold water for a few minutes.
- Do not rub the burnt region.
- Apply creams/ointments specially recommended, in case they are readily available.

(d) Your gardener has been bitten by a snake while digging soil in the flower bed:

- Immediately squeeze out some blood from the wound.
- Tie a tourniquet above the site to prevent spreading of venom into the body.