

1. Give one example of each of the following:

- (i) Germ killing body secretion.
- (ii) Germ trapping body secretion
- (iii) Mechanical barrier that prevents the entry of germs into the body.

Solution:

- (i) Germ killing body secretion – saliva
- (ii) Germ trapping body secretion - Sebum
- (iii) Mechanical barrier that prevents the entry of germs into the body – Mucus

2. Mention of the following statements are True(T) or false(F)

- (i) Immune system deals with the germs after they have entered the body.
- (ii) Antibodies eat up the germs
- (iii) Human beings can suffer from all those diseases which attack dogs
- (iv) Anti-venin injection against snake bite is an example of artificially acquired passive immunity.
- (v) Mother's antibodies may reach the fetus through placenta
- (vi) A person having once suffered from measles usually gets repeated attacks.

Solution:

- (i) The statement is true.
- (ii) The statement is true.
- (iii) The statement is false. Human beings are immune to a highly infectious disease of Dogs.
- (iv) The statement is true.
- (v) The statement is true.
- (vi) The statement is false. A person having once suffered from measles will not normally suffer from it again.

Progress Check

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1. Define the term prophylaxis.**Solution:**

Artificially introducing the germs or the germ substance into the body for developing resistance to a particular disease. Scientifically this process is referred to as prophylaxis.

2. Name the four categories of materials used for preparing vaccines.**Solution:**

The four categories of vaccines are:

- Killed germs
- Living weakened germs
- Living fully poisonous germs
- Toxoids

3. Name the diseases prevented by:**(i) Salk's vaccine****(ii) BCG vaccine****(iii) DTP vaccine****Solution:****(i) Salk's vaccine - Poliomyelitis****(ii) BCG vaccine - Tuberculosis****(iii) DTP vaccine – Pertussis(whooping cough), diphtheria, tetanus**

Progress Check

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1. Correct the following statements if they are false (without changing the first word).

- (i) **DDT is an antiseptic.**
- (ii) **Penicillin is a disinfectant.**
- (iii) **Disinfectants are applied on the body**
- (iv) **Deodorants are both antiseptic as well as disinfectants**
- (v) **Alexander Fleming discovered the first sulphonamide**
- (vi) **Antibiotics cannot be made synthetically**
- (vii) **Sulphonamides are now rarely used.**

Solution:

- (i) DDT is a disinfectant.
- (ii) Penicillin is an antibiotic.
- (iii) Disinfectants cannot be applied on the body
- (iv) Deodorants are neither antiseptics nor disinfectants.
- (v) Alexander Fleming discovered the first antibiotic
- (vi) Antibiotics can be made synthetically
- (vii) Sulphonamides are now rarely used.

2. List any three uses of antibiotics.

Solution:

The three uses of antibiotics are:

- They are used to fight infections
- Certain antibiotics are used as food preservatives, especially fresh meat and fish.
- Some are used to control plant pathogens

Review Questions

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A. Multiple Choice Type

(Select the most appropriate option in each case)

1. Penicillin is

- (a) An antiseptic
- (b) A disinfectant
- (c) An antibiotic
- (d) An anti-toxin

Solution:

- (c) An antibiotic

It was the first antibiotic discovered by Alexander Fleming.

2. “T” in DTP vaccination stands for

- (a) Tuberculosis
- (b) Typhoid
- (c) Tetanus
- (d) Tonsillitis

Solution:

- (c) Tetanus

DTP stands for Diphtheria, Tetanus and Pertussis

3. World Healthy Day is celebrated on

- (a) April 7
- (b) February 21
- (c) October 10
- (d) January 15

Solution:

- (a) April 7

It is celebrated to create consciousness about keeping oneself healthy and to disseminate the message at all levels.

4. DTP stands for

- (a) Diphtheria, Polio and Tetanus
- (b) Diphtheria, Pertussis and Tetanus
- (c) Dysentery, Polio and Typhoid
- (d) Diphtheria, Polio and Typhoid

Solution:

- (b) Diphtheria, Pertussis and Tetanus

DTP it is a vaccination used the treat Pertussis, Diphtheria and Tetanus

5. Vaccines are:

- (a) An extract of toxins secreted by bacteria
- (b) An extract of dead and weakened microbes

- (c) Strong chemicals obtained from fungi
- (d) Chemicals that are applied on the skin to kill bacteria.

Solution:

- (b) An extract of dead and weakened microbes
The material introduced into the body during the practice of prophylaxis is known as vaccine

B. Very short answer type

1. Name the following:

- (a) The drug based on arsenic compound, produced in 1910 which killed germs of syphilis.
- (b) The antibiotic that was discovered first.
- (c) The category of immunity required in the treatment of snake-bite.
- (d) Any four antiseptics, any two disinfectants and any two antibiotics.
- (e) The vaccines that help to produce immunity against Polio.

Solution:

- (a) The drug based on arsenic compound, produced in 1910 which killed germs of syphilis – Salvarsan and Arsphenamine
- (b) The antibiotic that was discovered first - Penicillin
- (c) The category of immunity required in the treatment of snake-bite – Passive acquired immunity
- (d) Any four antiseptics, any two disinfectants and any two antibiotics.

Antiseptics	Carbolic acid, Lysol, Boric acid, Iodine
Disinfectants	Cresol, phenol
Antibiotics	Penicillin, Ampicillin

- (e) The vaccines that help to produce immunity against Polio – OPV – Oral polio vaccine

2. Write the full forms of:

- (i) **AIDS**
- (ii) **BCG**
- (iii) **DPT vaccine**
- (iv) **WHO**
- (v) **HIV**
- (vi) **ATS**
- (vii) **TAB**
- (viii) **STD**

Solution:

- (i) AIDS – Acquired Immuno Deficiency Syndrome
- (ii) BCG – Bacillus Calmette Guerin
- (iii) DPT vaccine – Diphtheria Pertussis and Tetanus vaccine
- (iv) WHO – World Health Organization
- (v) HIV – Human Immunodeficiency virus
- (vi) ATS – Anti Tetanus Serum
- (vii) TAB – Typhoid Paratyphoid A & B
- (viii) STD – Sexually Transmitted Disease

3. Give the technical term for the kind of proteins produced in the blood to fight and destroy harmful microbes

Solution:

Antibodies. They are the immunoglobulin that are produced in the blood to fight and destroy harmful microbes.

C. Short Answer Type

1. Mention if the following statements are true (T) or false (F).

- (a) Lysol is an antibiotic.
- (b) Sweat and tears contain germs-killing substances.
- (c) Our body can make only a limited variety of different antibodies
- (d) Salk vaccine is used against tuberculosis
- (e) Treatment by the use of chemicals is known as allopathy
- (f) Alexander Fleming coined the term “antibiotic” for substances like penicillin.
- (g) DDT is a disinfectant.
- (h) Vaccine provides the body with Active Immunity
- (i) Penicillin was discovered by Alexander Fleming.
- (j) BCG is the vaccine given to babies to help build immunity against three common diseases.

Solution:

- (a) The statement is false. Lysol is an antiseptic
- (b) The statement is true.
- (c) The statement is false. Our body can make an unlimited variety of different antibodies
- (d) The statement is false. Salk vaccine is used against Poliomyelitis.
- (e) The statement is false. Use of chemicals to treat is known as chemotherapy
- (f) The statement is false. The term was coined by Selman Waksman.
- (g) The statement is true.
- (h) The statement is false. It provides the body with Passive Immunity.
- (i) The statement is true.
- (j) The statement is false. BCG is used to treat Tuberculosis.

2. Differentiate between:

- (a) Antiseptic and antibiotic
- (b) Antiseptic and disinfectant
- (c) Disinfectant and deodorant
- (d) Vaccination and sterilization
- (e) Active Immunity and passive immunity
- (f) Innate immunity and acquired immunity

Solution:

The differences are as follows:

- (a) Antiseptic and antibiotic

Antiseptic	Antibiotic
It is a mild chemical substance applied to the body to kill germs	It is a chemical substance produced by the microbes which kills or hinders the growth of

	microbes.
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(b) Antiseptic and disinfectant

Antiseptic	Disinfectant
It is a mild chemical substance applied to the body to kill germs	It is a strong chemical applied to spots on the body where germs live and multiply

(c) Disinfectant and deodorant

Disinfectant	Deodorant
It is a strong chemical applied to spots on the body where germs live and multiply	They are neither antiseptics nor disinfectants. They are used to mask bad smell and are aerosols.

(d) Vaccination and sterilization

Vaccination	Sterilization
It is the introduction of any kind of weakened/dead germs into the body of a living beings to develop resistance against diseases.	Process of elimination of microbes from a surface contained in a fluid, in compound such as biological culture media or in medication

(e) Active Immunity and passive immunity

Active Immunity	Passive immunity
Developed by an individual due to a previous infection or antigen which naturally enters the body	Immunity provided to an individual from an outside source as readymade antibodies.

(f) Innate immunity and acquired immunity

Innate Immunity	Acquired Immunity
It is the immunity by virtue of genetic constitutional makeup	It is the resistance to a disease the body acquires in his lifetime.

3. Name any three vaccines and the diseases for which they provide immunity.

Solution:

Three vaccines and the diseases for which they provide immunity are as follows:

Name of the Vaccine	Disease for which immunity provided
TAB	Typhoid
Salk's vaccine	Poliomyelitis
BCG	Tuberculosis

4. Given below is a table of certain vaccines, the diseases against which they are used and the nature of vaccine. Fill up the gaps 1 – 10.

Vaccine	Disease(s)	The nature of vaccine
TAB	1. _____	2. _____
Salk's vaccine	3. _____	4. _____
BCG	5. _____	Living weakened germs
Vaccine for measles	Measles	6. _____
Cowpox virus	7. _____	8. _____
Toxoids	9. _____	Extracts of toxins
	10. _____	Secreted by bacteria

Solution:

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
Vaccine 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

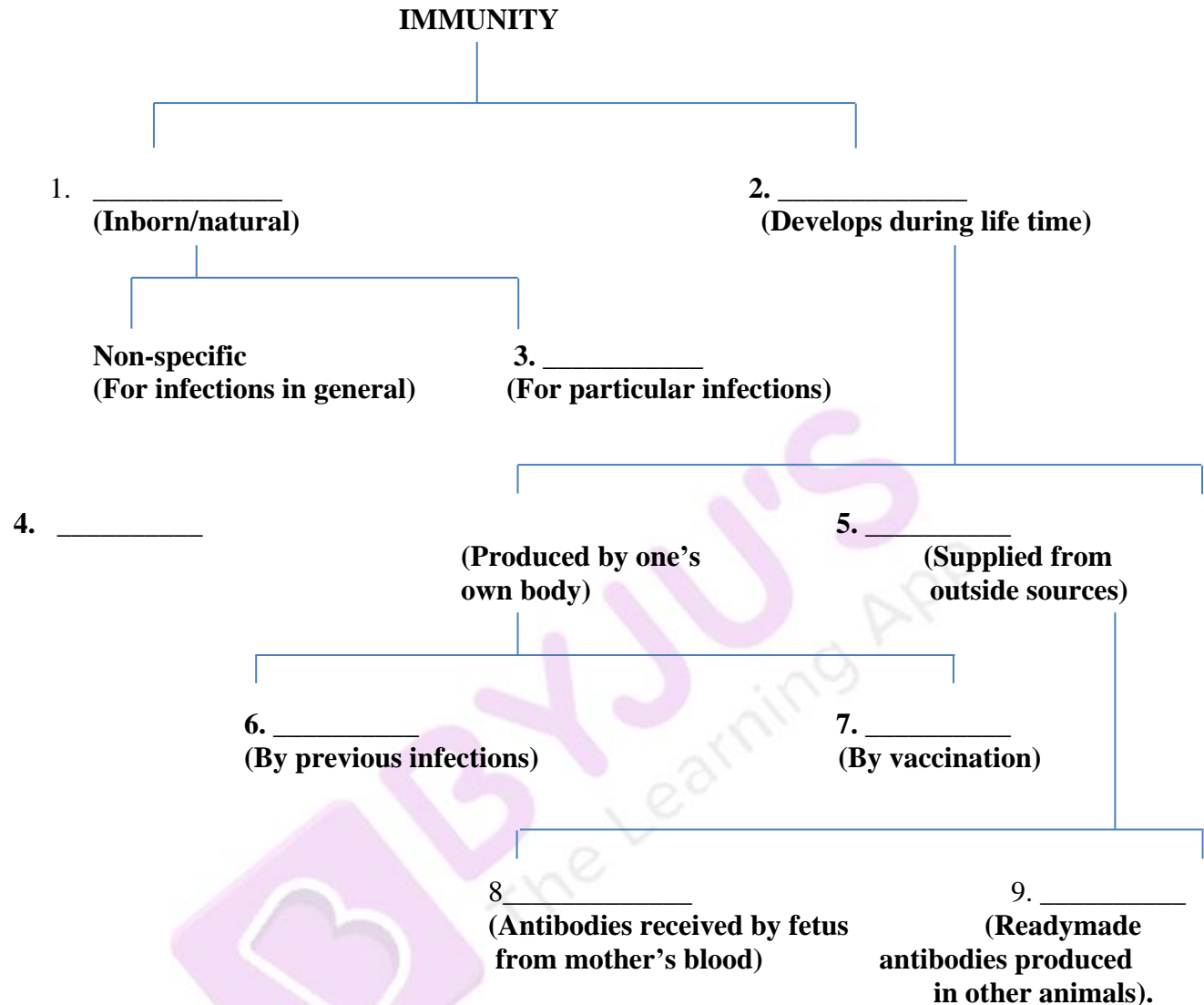
5. Given below are the groups of certain substances of particular categories. Mention the category of each group and identify the wrong example giving reason.

- (a) Lysol, benzoic acid, DDT, mercurochrome.
 (b) Formalin, Iodine, Lysol, Phenol
 (c) BCG, DTP, ATP.
 (d) Tears, Skin, Nasal Secretion, HCl (in stomach)

Solution:

- (a) Lysol, benzoic acid, DDT, mercurochrome – DDT is a wrong example as all others are antiseptics and DDT is a disinfectant which cannot be applied on the skin.
 (b) Formalin, Iodine, Lysol, Phenol – Iodine is a wrong example as all others are disinfectant where Iodine is an antiseptic
 (c) BCG, DTP, ATP – ATP is a wrong example as all others are vaccines whereas ATP carries energy in living cells.
 (d) Tears, Skin, Nasal Secretion, HCl (in stomach) – skin is a wrong example as all others are germ-killing secretions whereas skin is a protect mechanical barrier, preventing germ-entry.

6. Given below is a scheme of classifying immunity against human diseases. Fill up the types of immunity in the blanks 1-9.



Solution:

- 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

7. List any four ways in which the antibiotics are being used.

Solution:

Listed below are the four applications of antibiotics:

- They are widely used to fight infections

- They are used as food preservatives especially in fish and fresh meat
- Used in treating animal feed to prevent internal infections
- Used for controlling plant pathogens

8. List the merits of local defence system.

Solution:

Merits of the local defence system are as follows:

- They instantaneously start working
- They are not dependent on previous exposure to infections
- Are effective against a wide range of potentially infectious agents.

9. Suppose a person develops the disease diphtheria. Comment upon the principle of the treatment he should receive.

Solution:

Diphtheria is a bacterial disease and is infectious. It causes cold, cough, sneeze, if left untreated in severe cases, it may lead to paralysis or heart failure.

Treatment for Diphtheria:

- Combination of supportive care and medication
- Prompt intravenous administration of diphtheria toxoid which is made harmless
- Once this is administered into the body of the patient, it stimulates antibody production against pathogens that cause diphtheria

D. Long Answer Type

1. The principle of vaccination is to produce immunity against a disease. Explain.

Solution:

Vaccination is artificially introducing germs or its substances in the body in order to develop resistance to a particular disease. This practice, scientifically referred to as prophylaxis and the material being introduced is the vaccine. Vaccines are generally introduced by injection or orally sometimes.

Once the vaccine enters the body, it triggers the lymphocytes to synthesize antibodies to fight germs for that specific disease. Vaccines provide our immunity a signal to synthesize particular antibodies therefore the principal of vaccination is to provide immunity against a disease.

2. “Abnormally, large number of WBC’s in the blood are usually an indication of some infection in our body”. Comment on the statement.

Solution:

Whenever there is an infection in the body, the immune system receives a signal to synthesize particular antibodies. In response to the quantity of germ-multiplication in the body, white blood cells multiply rapidly which enables it to produce more antibodies thereby stopping in infection on time. Consequently, abnormal numbers of WBCs are an indication of some infection in the body.

3. Explain briefly, the role of the following health aids:

- (a) Antiseptics
- (b) Disinfectants
- (c) Vaccines

Solution:

- (a) Antiseptics -

It is a mild chemical substance applied to the body to prevent its growth and kill germs.

Example – Iodine and Lysol

- (b) Disinfectant –

These are the chemicals that kill microbes once they come in contact with them, they are too strong to be used on the body.

Example – Phenol and Cresol

- (c) Vaccines –

They are the substances that are administered in the body to provide passive immunity. These are the materials that are germs or secreted by germs.

Example – DTP, OPV