CHAPTER

6

Why Do We Fall Ill ?

Syllabus

Health and its failure. Infectious and non-infectious diseases, their causes and manifestation. Diseases caused by microbes (Virus, Bacteria and Protozoans) and their prevention; Principles of treatment and prevention. Pulse Polio programmes.

TOPIC-1
Health and Diseases

Revision Notes

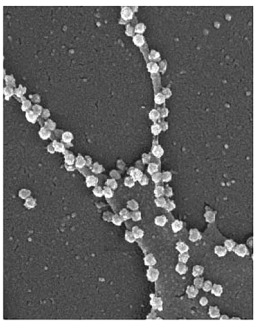
- **Health :** Health simply does not mean "absence of disease" or "physical fitness". It is defined as state of complete physical, social and mental well-being.
- **Significance of Good Heath:**
  - **(i)** It increases our efficiency for doing work, which in turn increases the productivity and brings economic prosperity.
  - **(ii)** It makes an individual happy and cheerful.
  - **(iii)** A healthy person can give proper.
  - **(iv)** It gives a condition for our purposeful existence in this world.
  - **(v)** It also increases the longevity of people and reduces infant and maternal mortality.
- A good health cannot be achieved entirely by an individual alone. It depends upon the surroundings or one's environment.
- Balanced diet, personal hygiene and regular exercise are very important key points of good health.
- **Disease :** When the functioning of one or more organs or system of the body is adversely affected, it is a sign that we are not healthy i.e. we are suffering from some disease. The term disease means Dis-ease i.e. without ease or comfort. It may be due to defective heredity, inappropriate diet, disturbed metabolism or pathogenic attack.
- The well being of our body is dependent on the proper functioning of its cells and tissues.
- All our body parts and activities are greatly interconnected. Hence, disfunction of any body part can affect the entire body.
- When we are healthy, we are able to perform our physical, mental and social functions well.
- Our physical and social environment plays an important role in maintaining good health.
- In addition to personal hygiene, public cleanliness should also be maintained to ensure that we remain healthy.
- Many other factors such as financial conditions, availability of nutritious food and social equality also influence the health of an individual.
- A person is said to be disease free, if there is no discomfort or derangement of the functioning of the body.
- Diseases are diagnosed with the help of symptoms or signs. Symptoms and signs of the disease appear as a result of dysfunction of the affected body parts. These help to identify the disease that a person is suffering from. A symptom indicates the presence of disease while sign provides information about the presence of particular disease.

- **Types of diseases :** Depending on their duration, diseases may be classified as acute or chronic.
- Acute diseases last for a short time and do not cause major health effects. Examples are cold, cough, influenza, typhoid etc.
- Chronic diseases persist , on the other hand for a long time, and hence, cause prolonged ill health. Examples are tuberculosis, cancer, diabetes, kidney stones etc.
- Causes of diseases may be immediate (first-level cause) or contributory. e.g., the immediate or direct cause of a person suffering from diarrhoea is the causative agent.
- **The contributory causes could be :**

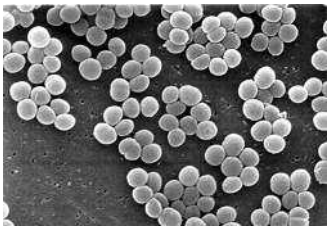
  (i) lack of adequate nourishment or genetic difference (second-level cause).

  (ii) proverty or lack of public services (third-level cause).
- Based on their ability or inability to spread from one individual to another, diseases may be infectious or non-infectious. Infectious diseases are caused by microbes or other infectious agents (e.g., Malaria) whereas non-infectious diseases have internal, non-infectious causes (e.g., High blood pressure).
- The infectious agents may be viruses, bacteria, fungi, protozoans or multicellular organisms such as worms.

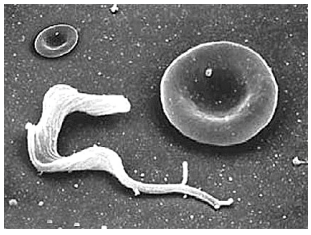
Category of infectious agent	Examples of diseases caused by them
Virus	Common cold, influenza, dengue fever, AIDS
Bacteria	Typhoid, cholera, tuberculosis, anthrax
Fungi	Skin infections
Protozoans	Malaria, kala-azar
Worms	Intestinal worm infections, elephantiasis



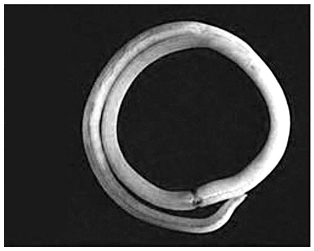
SARS viruses



Staphylococci the bacteria



Trypanosoma the protozoan



Picture of an adult roundworm *(Ascaris lumbricoides)* from the small intestine.

- Many infectious diseases are called 'communicable diseases' since they can spread from one person to another.
- Communicable diseases can spread through air, water, food, sexual contact or vectors.
- The droplets released during coughing or sneezing of an infected person can spread air-borne diseases such as common cold, pneumonia and tuberculosis.
- Air-borne diseases spread quickly in overcrowded and poorly-ventilated living conditions.
- Water-borne diseases such as cholera spread when drinking water gets contaminated with the infectious agents.
- Sexual contact causes the spread of diseases such as AIDS and syphilis from the infected person to a healthy one.
- AIDS virus can also spread through blood transfusions, use of infected needles or during pregnancy and breast-feeding by an infected mother.
- Vectors are intermediate animals causing the spread of disease-causing agents from an infected person to a healthy

  person. For example – Female *Anopheles* mosquitoes transmit many diseases like malaria when they feed on the blood of animals and humans.

SELF ASSESSMENT – 1

I. OBJECTIVE TYPE QUESTIONS [1 mark each]

A. Multiple Choice Questions

(R) **Q. 1. Which of these is an example of communicable disease ?**

(a) Tuberculosis **(b)** Diabetes
(c) Arthritis **(d)** Cancer

(AI) (R) **Q. 2. Viruses, which cause hepatitis is transmitted by**

(a) Air **(b)** Water
(c) Vector **(d)** Sexual contact

(R) **Q. 3. Which of the following is transmitted by sexual contact ?**

(a) Typhoid **(b)** Cholera
(c) Dysentery **(d)** AIDS

B. Passage Based Questions

(A) **Q. 1. Read the given situations and answer the following questions.**

(i) Seema of class IX was having common cold. She sits with Sarika who also develops the disease.

(ii) Meena of class IX shifted to a new residence, with his family, where water purification system has not been installed yet. He develops cholera and dysentery.

(a) Associate these situations with their mode of transmission.

(b) Assign appropriate category to them.

(c) 'Over crowded and poorly ventilated housing is a major factor in the spread of airborne diseases'. Explain the statement.

(d) Why are we advised to take bland and nourishing food when we are sick ?

C. Assertion and Reason Type questions

Directions : In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:

(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).

(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) Assertion (A) is false but reason (R) is true.

(K) **Q. 1. Assertion :** Communicable diseases are also called infectious diseases.

Reason : Cancer is a communicable disease.

(AI) (K) **Q. 2. Assertion :** A person suffering from AIDS cannot fight even very minor infections.

Reason : Casual organism of AIDS is HIV.

D. Very Short Answer Type Questions

(R) **Q. 1.** Name the causative organism of cholera.

(R) **Q. 2.** Which is the causative organism of acne?

(AI) (K) **Q. 3.** Why are signs of a disease more important than its symptoms ?

II. SHORT ANSWER TYPE QUESTIONS-I [2 marks each]

Q. 1. (i) Match the following columns with correct answer :

S. No.	Organism/Bacteria	Disease
(a)	Leishmania	Worm
(b)	Staphylococci	Kala-azar
(c)	Trypanosoma	Acne
(d)	Ascaris lumbricoides	Sleeping sickness

Q. 2. Differentiate between infectious and non-infectious diseases. Give one example of each.

(U) **(Board Term-II, 2012)**

III. SHORT ANSWER TYPE QUESTIONS-II [3 marks each]

(AI) **Q 1. (i)** Write difference between acute and chronic diseases.

(ii) Pick out chronic diseases from the list given below:

Japanese encephalitis, viral fever, common cold, tuberculosis. (U) (A)

Q. 2. (a) State the method of transmission of each of the following diseases :

(i) Cholera **(ii)** AIDS
(iii) Malaria **(iv)** Pneumonia

(b) Name the diseases a person will get if the disease causing microbes target the liver of a person. (R)

(AI) **Q. 3.** Which bacterium causes peptic ulcers? Who discovered the above pathogen for the first time?

IV. LONG ANSWER TYPE QUESTIONS [5 marks each]

(AI) **Q. 1.** 'Over crowded and poorly ventilated housing is a major factor in the spread of air-borne diseases'.

Explain the statement and support your answer with diagram. (A) **[Board Term-II 2014]**

Q. 2. What is a disease? How do we know that a person is diseased? What can be the various causes for a person getting diseased?

(R) **[Board Term-II 2016]**

TOPIC-2
Treatment and Prevention of Diseases

Revision Notes

- The type of treatment of a disease depends on the category of the infectious agent.
- Organisms belonging to the same category will share several important life processes, which will be different from those of organisms belonging to other categories.
- Drugs working by interfering with life processes of one category of organisms will not be effective against members of another category. e.g, antibiotics act against bacteria, but not against viruses, because viruses do not share bacterial pathways.
- Penicillin interferes with bacterial cell wall production and thus, kills the bacteria. Due to lack of cell walls, penicillin does not affect human cells.

Activity 6.1

m Observe people in your family and in your near by area suffering from cold/cough/fever. Do they take antibiotics for it or not.

m You will observe that the people who take antibiotics recover very soon.

- **Effects of microbes on the body :** On entering the body, the infectious agents reach their specific target organs. In certain cases, the target organ is related to their point of entry. For example – Typhoid-causing bacteria enter through mouth and reside in gut lining.
- In other instances, the target organ of the microbe has no relation to their point of entry. For example, HIV enters through the sexual organs, but spreads to all the lymph nodes.
- The symptoms of a disease depend on the target organ infected by the microbe. e.g., cough and breathing problems are seen when lungs are infected. Thus, we can get an idea of the target organ of the microbe, from the signs and symptoms of a disease.
- During infection, the activated immune system of the body sends specialized cells to destroy the microbes causing inflammation with associated local effects.
- There are certain conditions where the immune system is unable to protect the body. for example, the AIDS-causing virus destroys the functioning of the immune system, due to which the body becomes unable to fight even minor infections. Ultimately the patient succumbs to such infections.
- The severity of a disease is directly proportional to the number of infectious agents present in the body.
- **An infectious disease can be treated in two ways : (i)** Reduce the symptoms of the disease by providing treatment. **(ii)** Kill the infectious agent causing the disease.
- Medicines used in killing an infectious agent aim to disrupt some pathway of a vital life function peculiar to that group of organisms. These pathways are not present in other microbial groups or in humans.
- On entering human cells, viruses use our cellular machinery for carrying out all their life processes. There are very few virus-specific biochemical pathways that can be targeted to produce anti-viral drugs.
- **The approach of treatment of an infectious disease has three drawbacks :**
  (i) Recovery of the patient may not be complete in certain cases.
  (ii) Treatment requires time and hence, the patient suffers from the disease and may be bed ridden.
  (iii) The patient serves as source of infection to others.
- It is desirable to prevent a disease than to treat it completely.
- There are general and specific ways of preventing diseases.
- Infectious diseases can be generally prevented by public health hygiene methods, which aim to reduce exposure to infectious microbes. Public hygiene measures include providing safe drinking water, clean environment and adequately spacious conditions for living.

- Another general method of preventing infectious diseases requires the availability of sufficient and balanced diet for the proper functioning of the immune system. The immune system ensures that we do not develop a disease each time we are exposed to an infectious agent, by destroying the agent before it multiplies extensively.
- During small pox epidemics, it was noted that people who survived after suffering from small pox, did not get infected with it again. Such observations led to the birth of immunization, which is a specific method of preventing infectious diseases.
- The principle of immunization is based on the memory of the immune system on encountering an infectious agent. On subsequent encounters with the same or related microbe, the response of the immune system is multiplied extensively, leading to quick elimination of the infection.
- During immunization, a vaccine (containing weakened or killed pathogen or a specific part of the pathogen) is introduced into the body to fool the immune system in remembering a particular infection. Hence, the body does not suffer even on further exposures to that of pathogen or its close relatives.
- Nowadays, vaccines preventing many infectious diseases including tetanus, polio and measles are used extensively, especially in child health immunization programmes.
- Everyone in the community should have access to public hygiene and immunization for effective prevention of infectious diseases.

SELF ASSESSMENT – 2

I. OBJECTIVE TYPE QUESTIONS [1 mark each]

A. Multiple Choice Questions

(R) **Q. 1. Microbes are immediate cause of _____ disease.**
(a) Infectious **(b)** Non-infectious
(c) Acute **(d)** Chronic

(AI)(R) **Q. 2. Liver is damaged by the virus in**
(a) Pneumonia **(b)** Jaundice
(c) Malaria **(d)** Typhoid

(K) **Q. 3. Choose the correct statement regarding vaccination?**
(a) It develops resistance against pathogen attack.
(b) It kills pathogen causing disease
(c) It blocks the food supplied to pathogens
(d) It does not allow pathogens to multiply in hosts.

B. Passage based questions

(A) **Q. 1. Although Sonia has been suffering from cold and cough she decided to appear for her class test. Classmates seated close to her had an exposure to the infection being carried by Sonia. However, only one of them actually suffered from cold and cough.**
(a) Is cold and cough an acute or chronic disease?
(b) Explain, what prevented rest of those classmates catching cold and cough inspite of their exposure to the infection.
(c) Why taking an antibiotic is not effective in common cold ?
(d) What precautions can you take in your school to reduce the incidence of infectious diseases?

C. Assertion and Reason Type questions

Directions : In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A),
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

(K) **Q. 1. Assertion :** Polio is commonly called infantile paralysis.
Reason : It occurs only in infants and children.

(K) **Q. 2. Assertion :** Bland and nourishing food should be taken when we fall sick.
Reason : Such food contains fat, oil or spices. Hence, gets digested easily.

D. Very Short Answer Type Questions

(R) **Q. 1.** What is the major drawback of principle of treatment?

(AI)(K) **Q. 2.** Why personal hygiene is very essential for good health ?

(R) **Q. 3.** Write two ways by which HIV (AIDS virus) may get transmitted from one person to the other.

II. SHORT ANSWER TYPE QUESTIONS-I [2 marks each]

Q. 1. Same drug does not work against the microbes belonging to different groups. Why? State the mechanism of antibiotics in killing bacteria.
(A) **(Board Term-II, 2012)**

Q. 2. (i) For the prevention of infectious diseases, some public health programmes of childhood

immunisation are conducted in the country. Name four such diseases which are covered under this programme.

(ii) Name a disease which hs been eradicated from the world. State the principle behind its eradication. Ⓡ **(Board Term-II, 2016)**

III. SHORT ANSWER TYPE QUESTIONS-II [3 marks each]

Ⓐ Ⓘ **Q. 1.** What precautions can you take in your school to reduce the incidence of infectious diseases?

AI Ⓡ Ⓐ **Q. 2. (i)** What is the basis of principle of immunization?

(ii) Why are majority of the children in many parts of India already immune to Hepatitis - A though they have never been vaccinated against it?

IV. LONG ANSWER TYPE QUESTIONS [5 marks each]

Q. 1. "Educating parents would help a lot in reducing the incidences of diseases in children. Justify the statement with five reasons.

[Board Term-II 2015]

AI **Q. 2.** Explain the statement by giving two examples: 'It is not necessary that the pathogen may affect an organ or tissue depending upon the point of entry'. **[Board Term-II 2014]**

NCERT CORNER

Intext Questions

Q. 1. State any two conditions essential for good health. **[NCERT Q. 1, Page 178]**

Ans. (i) Health is a condition of human being in which he is free from any illness and is feeling well.

(ii) Conditions essential for good health are :

(a) Balanced and nutritious diet.

(b) Social and healthy environment.

Q. 2. State any two conditions essential for being free of disease. **[NCERT Q. 2, Page 178]**

Ans. Conditions essential for being free of disease are :

(i) Taking balanced and nutritious diet.

(ii) Living in a good, social, clean and healthy environment.

Q. 3. Are the answers to the above questions (Q. 1 and Q. 2) necessarily the same or different? Why? **[NCERT Q. 3, Page 178]**

Ans. (i) The answer to the above questions (Q. 1 and Q. 2) is same to some extent. Because if the conditions that are essential for good health are maintained then automatically the chances of getting disease will be minimised.

(ii) But at the same time, the answers are different because good health means the state of good physical, mental and emotional well-being whereas disease fee means not suffering from any disease.

Q. 4. List any three reasons why you would think that you are sick and ought to see a doctor. If only one of these symptoms were present, would you still go to the doctor? Why or why not? **[NCERT Q. 1, Page 180]**

Ans. (i) Common symptoms will make us to feel sick and make us think to see a doctor are :

(a) Cold and cough

(b) Loose motion

(c) Fever

(d) Headache

(ii) Moreover, it depends on the type of symptoms also. Because few symptoms, like headache or cold, do not have much effect on our daily life routine or our general health.

(iii) However, if anyone symptoms persist for more than 2–3 days then definitely we should visit to doctor for its further investigation and proper treatment.

Q. 5. In which of the following case do you think the long-term effects on your health are likely to be most unpleasant?

(i) if you get jaundice.

(ii) if you get lice.

(iii) if you get acne.

Why? **[NCERT Q. 2, Page 180]**

Ans. (i) In case of jaundice, the long-term effects on health are likely to be the most unpleasant.

(ii) Because,

(a) Jaundice is a chronic disease and takes long time to be completely cured.

(b) Moreover, it affects the whole body, especially liver, the most important part of our body.

(iii) Whereas lice and acne are acute problems of health which can be cured in a short period of time.

Q. 6. Why are we normally advised to take bland and nourishing food when we are sick?
[NCERT Exemp. Q. 28, Page 77]

Ans. We are advised to take bland and nourishing food when we are sick because our body needs energy to overcome the infection and the wear and tear of body organ. A nourishing food is easily digestible and contains all the nutrients. So, it provides nutrients to our body that will further provide energy and make new cells.

Q. 7. What are the different means by which infectious diseases are spread? **[NCERT Q. 2, Page 186]**

Ans. **(i)** Infectious disease may occur due to the presence and activity of a pathogenic microbial agent like bacteria, virus and protozoa.

(ii) It can be spread from one person to another, through the following means :

(a) Air : Disease transferred from air (through sneezing and coughing) is generally called air-borne disease. For example, common cold and pneumonia.

(b) Water and food : Disease caused due to contaminated food and water is called water-borne disease. It can cause disease like cholera and typhoid.

(c) Contact : Many diseases spread by contact of infected person with the healthy person. For example, fungal infections, scabies and skin disorder.

(d) Sexual contact : These are called sexually transmitted diseases, for example, AIDS and syphilis.

(e) Animals : These are referred to as vectors that spread disease by carrying pathogen from one place to another, for example, mosquitoes are vectors which carry pathogen-like protozoa (e.g., *Plasmodium* sp.) and causes malaria.

Q. 8. What precautions can you take in your school to reduce the incidence of infectious diseases?
[NCERT Q. 3, Page 187]

Ans. The precautions you can take in your school to reduce the incidence of infectious diseases are

(i) Preventing over-crowding classes.

(ii) Getting vaccinating before the infection affects.

(iii) Using clean toilets to prevent getting infection from there.

(iv) Staying at home if anyone suffers from infectious disease.

(v) Avoiding food which are exposed to flies or mosquitoes.

(vi) Drinking safe and clean water and washing hands before eating tiffin.

(vii) Avoid mosquito breeding by preventing water to stagnate in school premises.

(viii) Using handkerchief while sneezing and coughing to prevent the spreading of infectious disease.

Q. 9. What is immunisation? **[NCERT Q. 4, Page 186]**

Ans. **(i)** Immunisation is a process by which human being is made resistant to diseases or become free from any illnesses.

(ii) It can be done by giving vaccine for a disease. This vaccine then stimulates the immune system of body to protect against successive infection.

Q. 10. What are the immunisation programmes available at the nearest Health Centre in your locality? Which of these diseases are the major health problems in your area? **[NCERT Q. 5, Page 187]**

Ans. **(i)** The immunisation programmes available at the nearest Health Centre in our locality are :

(a) Bacille Calmette-Guérin (BCG) vaccine against tuberculosis.

(b) Polio drops against polio.

(c) Vaccination against chicken pox.

(d) Vaccination against hepatitis.

(e) DPT vaccination against diphtheria, pertussis (whooping cough) and tetanus.

(f) Immunisation against measles.

(ii) The major health problems are hepatitis, tuberculosis, tetanus and chicken pox.

NCERT Exercise

Q. 1. How many times did you fall ill in the last one year? What were the illnesses?

(a) Think of one change you could make in your habits in order to avoid any of/most of the above illnesses.

(b) Think of one change you would wish for in your surroundings in order to avoid any of most of the above illnesses.

Ans. I suffered last year from cold and cough (twice) and malaria (once).

To avoid any mentioned diseases, one has to change their habit and environment.

(a) Change of habit :

1. Should avoid the company of persons suffering from cough and cold.

2. Wear proper full clothes during changing season to give protection to the body and also against mosquito bite.

(b) Change in surroundings :

1. Improve the sanitary conditions in the surroundings.

2. Do not allow water to store near the houses, because it provides the breeding place for mosquitoes.

Q. 2. A doctor/nurse/health worker is exposed to more sick people than others in the community. Find out how she/he avoids getting sick herself/himself.

Ans. A doctor/nurse/health worker is exposed to more sick people than others in the community, still they avoid getting sick themselves because they take care of the following measures. For example,

(i) They keep their regularly used equipment sterilised properly.

(ii) There working area is also sterilised by using phenyl.

(iii) They always wash their hand with soaps after undergoing a thorough and serious check-up or examination.

(iv) They get vaccinated or immunised against various diseases.

Q. 3. Conduct a survey in your neighbourhood to find out what the three most common diseases are. Suggest three steps that could be taken by your local authorities to bring down the incidence of these diseases.

Ans. (i) Three most common diseases in my locality are diarrhoea, malaria and tuberculosis.

(ii) The following steps I would suggest to be taken by our local authorities to bring down the incidence of these diseases :

(a) Organising immunisation or vaccination camps.

(b) Supply of safe drinking water and preventing incidences of open drains.

(c) Eradication of mosquitoes and regular cleaning of drains and spraying of insecticides.

(d) Environment should be cleaned by making them free from garbage and wastes which were thrown in an open area.

Q. 4. A baby is not able to tell her/his caretakers that she/he is sick. What would help us to find out

(i) that the baby is sick?

(ii) what is the sickness?

Ans. (i) Sickness of baby can be judged by the following symptoms :

(a) Continuous crying and restlessness.

(b) Improper intake of food and body temperature.

(ii) Sickness should be diagnosed by observing the symptoms or its severity. It can be known by certain organ and tissue-specific symptoms (e.g., yellowness of skin and eyes indicate the jaundice and hepatitis).

Q. 5. Under which of the following conditions is a person most likely to fall sick?

(a) when she is recovering from malaria.

(b) when she has recovered from malaria and is taking care of someone suffering from chicken-pox.

(c) when she is on a four-day fast after recovering from malaria and is taking care of someone suffering from chicken-pox. Why?

Ans. (c) A person is most likely to fall sick when she is on a four-day fast after recovering from malaria and is taking care of someone suffering from chicken-pox.

Because during her fast she was on a limited diet and didn't get sufficient nourishment hence her health condition is poor and does not allowed her to do take care of a sick person.

Q. 6. Under which of the following conditions are you most likely to fall sick?

(a) when you are taking examinations.

(b) when you have travelled by bus and train for two days.

(c) when your friend is suffering from measles. Why?

Ans. (c) We are most likely to fall sick when a friend is suffering from measles.

Because measles is an infectious viral disease that can spread easily from one person to another.

It causes fever and red rashes all over the body.

NCERT Exemplar

Multiple Choice Questions

Q. 1. Which one of the following is not a viral disease?

(a) Dengue **(b)** AIDS

(c) Typhoid **(d)** Influenza

Ans. Correct option : (c)

Explanation : Typhoid is a bacterial disease, caused by the bacterium *Salmonella typhimurium (S. typhi)*. The bacterium lives in the intestine and bloodstream of humans.

Dengue is a mosquito-borne viral infection. It is caused by dengue virus and transferred from *Aedes aegypti* mosquito. Influenza (also called flu) is caused by different types of influenza virus. Acquired immunodeficiency syndrome (AIDS) is caused by HIV.

Q. 2. Which one of the following is not a bacterial disease?

(a) Cholera **(b)** Tuberculosis

(c) Anthrax **(d)** Influenza

Ans. Correct option : (d)

Explanation : Influenza is a viral disease. It is a contagious respiratory illness caused by influenza viruses. It infects the nose, throat and sometimes the lungs also. Flu viruses spread by droplets made when people with flu cough, sneeze or talk.

Q. 3. Which one of the following disease is not transmitted by mosquito?

(a) Brain fever **(b)** Malaria

(c) Typhoid **(d)** Dengue

Ans. Correct option : (c)

Explanation : Typhoid is a bacterial disease. It is caused by *S. typhi*. It is not transmitted by mosquito as it is water-borne disease.

Whereas brain fever, malaria and dengue are vector-borne diseases. Brain fever, also called encephalitis, is a viral infection which leads to acute inflammation of the brain. Malaria, a protozoan disease, is caused by *Plasmodium vivax* and spread through *Anopheles* mosquito. Dengue is a mosquito-borne viral infection caused by dengue virus and transferred from *Aedes aegypti* mosquito.

Q. 4. Which one of the following disease is not caused by bacteria?

(a) Typhoid **(b)** Anthrax

(c) Tuberculosis **(d)** Malaria

Ans. Correct option : (d)

Explanation : Malaria is a protozoan disease. It is caused by species of *Plasmodium* and spread through *Anopheles* mosquito. It is characterised by fever, chills, headaches, nausea, vomiting and general weakness with body aches.

Q. 5. Which one of the following diseases is caused by protozoans?

(a) Malaria **(b)** Influenza

(c) AIDS **(d)** Cholera

Ans. Correct option : (a)

Explanation : Malaria is a protozoan disease. It is caused by species of *Plasmodium* and spread through *Anopheles* mosquito. Whereas influenza and AIDS are viral diseases and cholera is a bacterial disease.

Q. 6. Which one of the following has a long-term effect on the health of an individual?

(a) Common cold **(b)** Chicken pox

(c) Chewing tobacco **(d)** Stress

Ans. Correct option : (c)

Explanation : Chewing tobacco may cause long-term effects on an individual. It may cause a variety of gum diseases, tooth decay and leukoplakia. Leukoplakia is a disease that forms light-coloured patches inside the mouth and can even lead to cancer.

Q. 7. Which of the following can make you ill if you come in contact with an infected person?

(a) High blood pressure

(b) Genetic abnormalities

(c) Sneezing

(d) Blood cancer

Ans. Correct option : (c)

Explanation : Sneezing is a semi-autonomous, sudden expulsion of air from the lungs through nose and mouth. It is usually caused by foreign particles which irritate the nasal mucosa. Therefore, the little droplets, expelled out while sneezing, carry pathogenic microbes. So, a person is in close vicinity of an infected person can inhale these disease-causing microbes and get infected.

Q. 8. AIDS cannot be transmitted by

(a) sexual contact. **(b)** hugs.

(c) breast-feeding. **(d)** blood transfusion.

Ans. Correct option : (b)

Explanation : Acquired immunodeficiency syndrome (AIDS) is a syndrome caused by a virus called HIV (human immunodeficiency virus). It is a sexually-transmitted disease and cannot be transmitted by hugs.

Whereas sexual contact, breast-feeding, and blood transfusion are modes of transmission of AIDS.

Q. 9. Making anti-viral drugs is more difficult than making anti-bacterial medicines because

(a) viruses make use of host machinery.

(b) viruses are on the border line of living and non-living.

(c) viruses have very few biochemical mechanisms of their own.

(d) viruses have a protein coat.

Ans. Correct option : (a)

Explanation : Virus is a large group of sub-microscopic infective agents. Viruses cannot reproduce without a host cell, therefore making anti-viral drugs is more difficult than making anti-bacterial medicines. Virus as a living agent that can multiply only within a living cells of host. It makes use of host machinery.

Q. 10. Which one of the following causes kala-azar?

(a) *Ascaris* **(b)** *Trypanosoma*

(c) *Leishmania* **(d)** Bacteria

Ans. Correct option : (c)

Explanation : Kala-azar is caused by a protozoan parasite of genus *Leishmania.* It is a chronic and fatal parasitic disease of the viscera like internal organs, particularly the liver, spleen, bone marrow and lymph nodes. It is characterised by fever, weight loss, fatigue, anaemia and swelling of liver and spleen.

Q. 11. If you live in an over crowded and poorly ventilated house, it is possible that you may suffer from which of the following diseases ?

(a) Cancer **(b)** AIDS

(c) Air borne diseases **(d)** Cholera

Ans. Correct option : (c)

Explanation : If you live in an over-crowded and poorly-ventilated house, it is possible to contact air-borne diseases. In closed areas, the droplets nuclei re-circulate and pose a risk to everybody. Thus, over-crowded and poorly-ventilated houses are major factors in spreading of air-borne diseases.

Q. 12. Which disease is not transmitted by mosquitoes?

(a) Dengue

(b) Malaria

(c) Brain fever or encephalitis

(d) Pneumonia

Ans. Correct option : (d)

Explanation : Pneumonia is an inflammatory condition of lung affecting the lung alveoli. It is caused by a virus or bacteria. Symptoms include cough, chest pain, fever and difficulty in breathing. Pneumonia is an air-borne disease whereas dengue, malaria and brain fever (also called Japanese encephalitis) are vector-borne diseases (mosquito). Dengue, malaria and brain fever are transmitted by *Aedes aegypti*, *Anopheles* and *Culex tritaeniorhynchus* mosquitoes respectively.

Q. 13. Which one of the following is not important for individual health?

(a) Living in clean space.

(b) Good economic condition.

(c) Social equality and harmony.

(d) Living in a large and well-furnished house.

Ans. Correct option : (d)

Explanation : Living in a large and well-furnished house is not an important factor for individual health. There are other various conditions which are essential for good health. These are : clean living area; availability of clean and safe water, nutritious and balanced diet; social equality and harmony, etc.

Q. 14. Choose the wrong statement.

(a) High blood pressure is caused by excessive weight and lack of exercise.

(b) Cancers can be caused by genetic abnormalities.

(c) Peptic ulcers are caused by eating acidic food.

(d) Acne is not caused by staphylococci.

Ans. Correct option : (c)

Explanation : Peptic ulcers are caused by bacterium *H. pylori.* They are eruptions that develop on the inside lining of the stomach and the upper portion of the small intestine. They will cause burning stomach pain, especially when the stomach is empty, bloating, belching, heartburn, nausea, or intolerance to fatty foods.

Q. 15. We should not allow mosquitoes to breed in our surroundings because they :

(a) multiply very fast and cause pollution.

(b) are vectors for many diseases.

(c) bite and cause skin diseases.

(d) are not important insects.

Ans. Correct option : (b)

Explanation : Many animals which live with us carry disease. These animals transfer infecting agents from sick person to another healthy person and act as vectors. Mosquitoes are known to cause many diseases. For examples, Mosquito *Anopheles*, *Culex* and *Aedes* causes malaria, filariasis and dengue respectively.

Q. 16. You are aware of Polio Eradication Programme in your city. Children are vaccinated because :

(a) vaccination kills the polio causing microorganisms.

(b) prevents the entry of polio causing organism.

(c) it creates immunity in the body.

(d) all the above

Ans. Correct option : (c)

Explanation : Children are vaccinated by the vaccine to improve immunity to a particular disease. It contains an agent that resembles a disease-causing microorganism which is made from weakened or killed microbe. The pulse polio programme is an immunisation drive against polio. Polio is a disease of the muscles and nerves which can even cause paralysis. To prevent this disease, oral vaccines are given periodically to all children under 5 years of age in India.

Q. 17. Viruses, which cause hepatitis, are not transmitted through

(a) air **(b)** water

(c) food **(d)** personal contact

Ans. Correct option : (a)

Explanation : Hepatitis-A virus (HAV) is transmitted through ingestion of contaminated food, water or through direct contact with an infectious person. Hepatitis is a condition in which swelling of liver takes place due to viral infection. Viral hepatitis is of following types - hepatitis A, B, C, D, and E. A different virus is responsible for each type of virally transmitted hepatitis.

The most common symptoms of hepatitis are : loss of appetite, fatigue, mild fever, muscle or joint aches, nausea, vomiting, and pain in stomach.

Q. 18. Vectors can be defined as :

(a) animals carry the infecting agents from sick person to another healthy person.

(b) micro-organisms which cause many diseases.

(c) infected person.

(d) diseased plants.

Ans. Correct option : (a)

Explanation : Vector may be defined as an animal that does not cause disease itself, but spreads infection by transferring pathogens from one host to another. For example, species of mosquito serve as vectors for malaria and dengue.

Short Answer Questions

Q. 19. Give two examples and features for each of the following :

(a) Acute diseases

(b) Chronic diseases

(c) Infectious diseases

(d) Non-infectious diseases.

Ans.

S. No.	Types of diseases	Features	Examples
(i)	Acute disease	• Last for short period of time. • Caused randomly. • Does not cause major effect on health.	Cough, dysentery
(ii)	Chronic disease	• Last for long period of time. • Caused in due course of time. • Cause major effects on health.	Heart disease, tuberculosis
(iii)	Infectious disease	• Also called communicable disease. • Spread from infected person to healthy person. • Caused by pathogens like virus, bacteria, fungi and protozoans. • Transmitted through direct contact or medium.	Cold, influenza, chicken pox
(iv)	Non-infectious disease	• Also called non-communicable disease. • Do not pass on from one person to another • Caused by factors like genetics and environmental. • It does not transmit through direct contact or some medium.	Hemophilia, diabetes

Q. 20. Name two diseases caused by Protozoans. What are their causal organisms?

Ans. Diseases caused by protozoans are :

(i) Malaria : It is caused by *Plasmodium* species via *Anopheles* mosquito.

(ii) Amoebic dysentery : It is caused by *Entamoeba histolytica*.

Q. 21. Which bacterium causes peptic ulcers? Who discovered the above pathogen for the first time?

Ans. (i) *H. pylori* causes peptic ulcers. Peptic ulcer is a painful sore inside the stomach or another part of the digestive system like intestine.

(ii) Scientists Robin Warren and Barry Marshal discovered the pathogen for the first time.

(iii) Robin Warren discovered these pathogens as small curved bacteria in the lower part of the stomach and noticed that inflammation was always present near these bacteria.

Q. 22. What is an antibiotic? Give two examples.

Ans. (a) These are drugs that help to stop the infections caused by bacteria.

(b) These are produced by one micro-organism that selectively inhibits the growth of another. **Examples :** Penicillin and streptomycin.

Q. 23. Fill in the blanks.

(a) Pneumonia is an example of _____ disease.

(b) Many skin diseases are caused by_____.

(c) Antibiotics commonly block biochemical pathways important for the growth of _____.

(d) Living organisms carrying the infecting agents from one person to another are called _____.

Ans. (a) Infectious. Pneumonia is an infection of lungs. It is an example of infectious disease, caused by bacterial or viral infection.

(b) Fungi. Many skin diseases are caused by fungi.

(c) Bacteria. Antibiotics are the drugs that are used to cure diseases caused by bacteria.

(d) Vectors. Vectors are living organisms carrying the infecting agents from one person to another.

Q. 24. Name the target organs for the following diseases.

(a) Hepatitis targets _____.

(b) Fits or unconsciousness targets _____.

(c) Pneumonia targets _____.

(d) Fungal disease targets _____.

Ans. (a) Liver. Hepatitis is the inflammation of liver.

(b) Brain. Fits and unconsciousness result due to disturbance in the electrical activity of the brain in a condition called epilepsy. In serious condition, patients may feel consciousness or experience convulsions.

(c) Lungs. Pneumonia is a lung inflammation caused by bacterial or viral infection. In this condition, air sacs (alveoli) of lungs are filled with pus and may become solid.

(d) Skin. The major organ involved in fungal diseases is skin.

Q. 25. Who discovered 'vaccine' for the first time? Name two diseases which can be prevented by using vaccines.

Ans. (i) Edward Jenner (also known as the Father of Immunology) discovered small pox 'vaccine' for the first time on 14 May 1796.

(ii) He took fluid from a cowpox blister and scratched it into the skin of an 8-year-old

boy, James Phipps. A single blister rose up on the spot, but James soon recovered. On 1 July 1796, Jenner immunised the boy again, this time with smallpox matter, and no disease developed.

(iii) Small pox and polio can be prevented by using these vaccines.

Q. 26. Fill in the blanks.

(a) _____ disease continues for many days and causes _____ on body.

(b) _____ disease continues for a few days and causes no longer term effect on body.

(c) _____ is defined as physical, mental and social well-being and comfort.

(d) Common cold is_____ disease.

(e) Many skin diseases are caused by_____.

Ans. (a) Chronic, long-term effect. Chronic disease is a long-term disorder which causes long-term effect on body health.

(b) Acute. Acute disease continues for a few days and causes no longer term effect on body health.

(c) Health. Health may be defined as physical, mental and social well-being and comfort.

(d) Viral. Common cold is an example of acute contagious disease of upper respiratory tract, caused by virus.

(e) Fungi. Many skin diseases are caused by fungi.

Q. 27. Classify the following diseases as infectious or non-infectious.

(a) AIDS (b) Tuberculosis (c) Cholera (d) High blood pressure (e) Heart disease (f) Pneumonia (g) Cancer.

Ans. (a) AIDS : Infectious disease

(b) Tuberculosis : Infectious disease

(c) Cholera : Infectious disease

(d) High blood pressure : Non-infectious disease

(e) Heart disease : Non-infectious disease

(f) Pneumonia : Infectious disease

(g) Cancer : Non-infectious disease

Q. 28. Name any two groups of micro-organisms from which antibiotics could be extracted.

Ans. Two groups of micro-organisms that produce antibiotics are :

(i) Bacteria (*e.g.*, *Streptomyces cerevisiae* produces Streptomycin).

(ii) Fungi (*e.g.*, Penicillin produced by *Penicillium notatum* molds).

Q. 29. Name any three diseases transmitted through vectors.

Ans. (i) Diseases transmitted through vectors are

S. No.	Disease	Vector	Pathogen
(i)	Malaria	*Anopheles*	Parasitic protozoan *Plasmodium* sp.
(ii)	Dengue	*Aedes aegypti*	RNA virus of genus Flavivirus
(iii)	Leishmaniasis	Sand flies	Protozoan parasite of *Leishmania* sp.

Long Answer Questions

Q. 30. Explain giving reasons.

(a) Balanced diet is necessary for maintaining healthy body.

(b) Health of an organism depends upon the surrounding environmental conditions.

(c) Our surrounding area should be free of stagnant water.

(d) Social harmony and good economic conditions are necessary for good health.

Ans. (a) 1. A balanced diet contains all the essential nutrients which are required to maintain proper health as well as proper growth and repair.

2. Lack of single nutrient may cause deficiency diseases.

(b) 1. Surrounding environmental conditions play an important role in the maintenance of health. For example, we feel depressed if surroundings are dirty or polluted; garbage is not collected or disposed of; drains are not cleaned; and water collects in the streets or open spaces.

2. This unclean surrounding causes the entry of germs via air, water, food or vectors and makes the person unhealthy.

(c) 1. Stagnant water provides a breeding ground for several disease-causing insects, especially mosquitoes.

2. Mosquito acts as a vector for several diseases like malaria, dengue, etc. So, if we keep our surroundings clean and free from stagnant water, then these vectors will not find any place for breeding and automatically their population will decrease. This, in turn, will prevent the spread of insect-borne diseases.

(d) 1. Human beings live in societies and different localities like villages or cities, which determine the social and physical environment and hence both are kept in harmony.

2. Public cleanliness is important for individual health. For better living conditions money is required. We need good food for healthy

body and for this we have to earn. For the treatment of diseases also, one must be in good economic condition.

Q. 31. What is a disease? How many types of diseases have you studied? Give examples.

Ans. **(i)** Disease may be defined as a malfunctioning of the normal state of the living organism. It disturbs or modifies the performance of the vital organs and hampers their function.

(ii) Types of diseases based on :

(a) duration : Acute and chronic.

(b) period of occurrence : Congenital and acquired.

(c) causal agent : Infectious and non-infectious.

(iii) Infectious or communicable diseases can be contagious or non-contagious.

(iv) Non-infectious disease may be deficiency disease, metabolic disease, degenerative disease, allergy, cancer and injury.

(v) Examples of infectious disease are influenza, tuberculosis, pneumonia; and cancer is non-infectious.

Q. 32. What do you mean by disease symptoms? Explain giving two examples?

Ans. **(i)** Disease symptoms may be defined as some visual changes in mental or physical feature of human beings. These abnormal signs indicate a disease.

(ii) Based on these symptoms, doctors explore the definite sign for a disease, for example, symptoms for malaria and typhoid are similar like fever, weakness, headache, etc., but signs for both the diseases are different as malaria fever reveals through chills and that of typhoid fever - rashes, stomach pain, etc.

(iii) A simple blood test [complete blood count (CBC)] is enough to detect malarial infection and for typhoid widal test is conducted.

(iv) Examples of disease symptoms are given below :

(a) Cough is the most common symptom of lung infection.

(b) Lesions on the skin are the symptoms of chicken pox.

Q. 33. Why is immune system essential for our health?

Ans. **(i)** Immune system is a network of cells, tissues, and organs that work together to protect the body against disease-causing germs.

(ii) When bacteria, viruses and other germs enter the body, they multiply and attack. This invasion is called an infection.

(iii) It is a defence mechanism of our body. It plays an important role in distinguishing the acquired and inborn diseases of a body.

(iv) Immune system is essential for health because when a person suffers from a disease once, antibodies for these disease-causing antigens will be formed in the body and keep away from the same disease again. Vaccines also help in acquiring immunity.

(v) If the immune system is strong, body can easily fight disease-causing pathogens, keeping us healthy.

Q. 34. What precautions will you take to justify "prevention is better than cure".

Ans. **(i) When someone gets a disease he/she suffered from the following :**

(a) Body function may get damaged and may never recover completely.

(b) Become bedridden for some time and cut-off from their daily routine activities.

Therefore, prevention is better than cure.

(ii) Precautions to justify "Prevention is better than cure" are given below :

(a) Eradication or sterilisation of pathogenic vectors

(b) Eat balanced food to prevent nutrient deficiency.

(c) Maintaining a hygienic environment and proper provisions for safe disposal of human excreta and domestic waste.

(d) Always wash your hands before and after every meal.

(e) Awareness on sexually-transmitted disease should be given to every person as possible to avoid these diseases.

(f) Immunisation through proper vaccination procedures and advertising about the importance is necessary.

Q. 35. Why do some children fall ill more frequently than others living in the same locality?

Ans. **(i) Some children fall ill more frequently than others living in the same locality because**

(a) Their immune system is weak. When people have weak immune systems, their defence against pathogens becomes weak and they will tend to get sick quite often.

(b) Improper sanitation and consuming polluted water.

(ii) Immune system is the natural defence system that helps fight infections.

(iii) It is made up of antibodies, WBCs, other chemicals and proteins that attack and destroy disease-causing bacteria and viruses that they recognise as foreign and different from the body's normal healthy.

(iv) Weak immune system may be due to malnutrition, hereditary factors and failure of being breast-fed can also be a contributing factor in children and babies.

(v) Balanced diet and proper nutrition for healthy body is required to have a strong immune system.

Q. 36. Why are antibiotics not effective for viral disease?

Ans. (i) Antibiotics are produced by micro-organisms to kill or control the growth of other micro-organisms by blocking their specific metabolic pathways within the cell.

(ii) Since bacteria are so different to human cells, antibiotics can be taken by humans to kill bacteria without harming the human cells.

(iii) Viruses cannot be treated with antibiotics because,

(a) Virus does not carry out many metabolic processes themselves. They depend on host cell (human cell).

(b) It is impossible to destroy the virus without harming the human cells.

(c) Viruses are so simple that they use their host cells to perform their activities for them. So antiviral drugs work differently to antibiotics, by interfering with the viral enzymes instead.

Q. 37. Becoming exposed to or infected with an infectious microbe does not necessarily mean developing noticeable disease. Explain.

Ans. (i) Becoming exposed to or infected with an infectious microbe does not necessarily mean developing noticeable disease. In this situation, immunity plays an essential role.

(ii) Immune system plays an important role in fighting of diseases and protects us against various infectious diseases.

(iii) White blood cells, produced in the bone marrow, are carried to the blood to specialised organs where they develop immune responses against infections.

(iv) Every disease has an incubation period. If within that time, WBC fights off the microbe, the disease does not develop. Sometimes, there exist some diseases that damage body internally but don't show any changes which are noticeable (*e.g.*, diabetes).

(v) Some WBCs like macrophages destroy and engulf bacteria and damaged cell. The body cells produce antibodies which can neutralise viruses, bacteria or toxic proteins in blood and body fluids.

(vi) Infectious diseases may be self-limiting. It means that our immune system can successfully eliminate pathogens. Many viral diseases are self-limiting. Other infections may require treatment with anti-microbial drugs appropriate for specific pathogen.

Q. 38. Give any four factors necessary for a healthy person.

Ans. (i) Healthy person may be defined as a person who is in a good physical or mental condition or in good health.

(ii) Factors necessary for a healthy person are :

(a) Proper, sufficient nourishment and food : It is necessary for good immune system of our body.

(b) Personal hygiene : It prevents infectious diseases.

(c) Clean surrounding area : The surrounding environment should be clean. Air and water-borne diseases should not be spread.

(d) Immunisation against severe diseases : It provides immunity.

Q. 39. Why is AIDS considered to be a 'Syndrome' and not a disease?

Ans. (i) AIDS is acquired immunodeficiency syndrome.

(ii) It is a syndrome, not a disease because it is a medical condition or a group of symptoms or illnesses that occur at the very final stage of HIV infection. HIV is a human immunodeficiency virus, which may or may not appear in the advanced stage of HIV infection.

(iii) HIV is a retro-virus that attacks immune cells [called clusters of differentiation (CD-4) cells] which are a subset of T cells [white blood cells (WBCs)]. These white cells act as body's natural defence against many infections.

(iv) It is because of AIDS only that many other diseases like pneumonia, typhoid and various forms of cancers can occur due to weak immune system.

BOARD CORNER

Short Answer Type Questions

Ⓡ Q. 1. What are the three different means by which infectious diseases are spread? Give one example of each. (Board Term-II, 2019) 3

Ans. **Three means by which infectious diseases are spread are :**

(i) Air – Example : Tuberculosis.

(ii) Vectors – Example : Malaria.

(iii) Sexual contact – Example : AIDS. **1+1+1**

Ⓤ Q. 2. What is the difference between Acute and Chronic disease. [OS] (Board Term-II, 2018) 2

Ans. **Differences between acute disease and chronic disease are :**

S.No.	Acute Disease	Chronic Disease
(i)	They are short duration diseases.	They are long lasting diseases.
(ii)	The patient recovers completely after the cure.	The patient does not recover completely.
(iii)	Example–Common Cold	Example–Chickenpox, typhoid, cholera

(Any two) 2

Ⓚ Q. 3. Why do some children fall ill more frequently than others living in the same locality? Mention three reasons. (Board Term-II, 2016-17) 3

Ans. It may be due to **(i)** poor immune system **(ii)** due to inadequate balanced diet **(iii)** due to poor personal hygienic conditions. **1+1+1**

Ⓐ Q. 4. Of human excreta, faeces are the most dangerous to health. Comment.

(Board Term-II, 2017) 3

Ans. Faeces from an infected person can contain viral pathogens, bacterial pathogens, protozoan cysts or ocysts, and helminth eggs. This contamination is a major cause of diarrhoea, and leads to other major diseases such as cholera, schistosomiasis, and trachoma. There are many allergens like faecal material of house dust mites may cause asthma attacks or 'hay fever'. **3**

Ⓚ Q. 5. Give the ways by which microbial agents can commonly move from an infected person to someone else for the following diseases.

(a) Cholera, **(b) Pneumonia,**

(c) Common cold, **(d) Malaria,**

(e) Fungal Infection

(Board Term-II, 2016-2017)

Ans. **(a)** Water, **(b)** Air

(c) Air **(d)** Mosquito

(e) Touch or by using infected napkins, towels etc. **3**

Ⓐ Q. 6. The number of dengue cases had increased in Anita's village in last one year. She read in her text book that diseases like dengue spread through mosquitoes which breed in stagnant water. She immediately discussed with her friends and decided to kill the mosquitoes and their larvae in water bodies in her locality. They also look help of nearest municipal office.

Answer the following questions based on above information :

(a) Which preventive measure do you suggest for the prevention of such diseases caused by mosquitoes? Mention any two measures.

(b) Which values are displayed by Anita in taking initiative?

(c) Suggest one school activity to promote such value in school students.

(Board Term-II, 2016-2017) 3

Ans. **(a)** **(i)** Stagnant water should be flown out.

(ii) Mosquitoes repellent should be used.

(b) Awareness, carefulness, social-well being nature and intelligent.

(c) Knowledge about after effects of mosquito's bite should be imparted to students. Students should be aware of preventive measures to keep away mosquitoes.

School should organise a workshop for students health and hygiene. **1+1+1**