**1. What is health? How will health be affected?**

Health is the state of complete physical, mental, and social wellbeing.

Health increases productivity and ensures longevity.

Health is affected by –

(i) Genetic disorders – deficiencies with which a child is born and deficiencies/defects which the child inherits from parents from birth;

(ii) Infections and

(iii) Lifestyle including food and water we take, rest and exercise we give to our bodies, habits that we have or lack etc.

**2. How to ensure good health?**

Balanced diet, personal hygiene and regular exercise are very important to maintain good health. Yoga has been practiced since time immemorial to achieve physical and mental health. Awareness about diseases and their effect on different bodily functions, vaccination (immunization) against infectious diseases, proper disposal of wastes, and control of vectors and maintenance of hygiene in food and water resources are necessary for achieving good health.

**3. What are the various public health measures, which you would suggest as safeguard against infectious diseases?**

Answer:

Public health measures are preventive measures which are taken to check the spread of various infectious diseases.

These measures should be taken to reduce the contact with infectious agents.

Some of these methods are:

(1) Maintenance of personal and public hygiene: It is one of the most important methods of preventing infectious diseases. This measure includes maintaining a clean body, consumption of healthy and nutritious food, drinking clean water, etc. Public hygiene includes proper disposal of waste material, excreta, periodic cleaning, and disinfection of water reservoirs.

(2) Isolation: To prevent the spread of air-borne diseases such as pneumonia, chicken pox, tuberculosis, etc., it is essential to keep the infected person in isolation to reduce the chances of spreading these diseases.

(3) Vaccination: Vaccination is the protection of the body from communicable diseases by administering some agent that mimics the microbe inside the body. It helps in providing passive immunization to the body. Several vaccines are available against many diseases such as tetanus, polio, measles, mumps, etc.

(4) Vector Eradication: Various diseases such as malaria, filariasis, dengue, and chikungunya spread through vectors. Thus, these diseases can be prevented by providing a clean environment and by preventing the breeding of mosquitoes. This can be achieved by not allowing water to stagnate around residential areas. Also, measures like regular cleaning of coolers, use of mosquito nets and insecticides such as malathion in drains, ponds, etc. can be undertaken to ensure a healthy

environment. Introducing fish such as Gambia in ponds also controls the breeding of mosquito larvae in stagnant water.

**4. What are the types of diseases? What's the difference between infectious diseases and noninfectious diseases?**

Diseases can be broadly grouped into infectious and noninfectious.

Diseases which are easily transmitted from one person to another, are called infectious diseases. Infectious diseases are very common and every one of us suffers from these at some time or other. Some infectious diseases like AIDS are fatal. Among non-infectious diseases, cancer is the major cause of death. Drug and alcohol abuse also affect our health adversely.

Infectious diseases are illnesses caused by harmful organisms (pathogens) that get into your body from the outside. Pathogens that cause infectious diseases are viruses, bacteria, fungi, parasites and, rarely, prions. You can get infectious diseases from other people, bug bites and contaminated food, water or soil.

Infectious diseases are caused by harmful organisms that get into your body from the outside, like viruses and bacteria. Noninfectious diseases aren't caused by outside organisms, but by genetics, anatomical differences, getting older and the environment you live in. You can't get noninfectious diseases from other people, by getting a bug bite or from your food.

The flu, measles, HIV, strep throat, COVID-19 and salmonella are all examples of infectious diseases. Cancer, diabetes, congestive heart failure and Alzheimer's disease are all examples of noninfectious diseases.

**5. In which way has the study of biology helped us to control infectious diseases?**

Answer:

Various advancements that have occurred in the field of biology have helped us gain a better understanding to fight against various infectious diseases. Biology has helped us study the life cycle of various parasites, pathogens, and vectors along with the modes of transmission of various diseases and the measures for controlling them. Vaccination programmes against several infectious diseases such as smallpox, chicken pox, tuberculosis, etc. have helped eradicate these diseases. Biotechnology has helped in the preparation of newer and safer drugs and vaccines. Antibiotics have also played an important role in treating infectious diseases.

**6. What are pathogens? List the types of pathogenic diseases.**

Pathogens are the parasites that enter the human body through various means, then multiply, and interfere with normal vital activities.

Types are:

Bacterial Diseases

Viral Diseases

Fungal Diseases

Protozoan Diseases

Diseases Caused by Worms

**7. What are the bacterial diseases? Explain them briefly**

**Typhoid**

○ Pathogen− Salmonella typhi

○ Spreads through − Contaminated food and water

○ Site of infection − Small intestine

○ Symptoms − High fever, stomach pain, headache, loss of

Appetite, constipation, and intestinal perforations in severe cases

○ Confirmatory test − Widal test

**Pneumonia**

○ Pathogens − Streptococcus pneumoniae and Haemophilus Influenza

○ Spreads through − Droplets/aerosols released from infected person, sharing of glasses or utensils

○ Site of infection − Alveoli (gets filled with fluid, difficulty in breathing)

○ Symptoms − Fever, chills, cough, headache, lips and nails become gray in severe cases.

**8. What are the viral diseases? Explain them briefly**

**Common cold**

○ Pathogen − Rhino viruses

○ Site of infection − Nose and respiratory passage

○ Spreads through − Droplets released from coughing or sneezing, or contaminated objects

○ Symptoms − Nasal congestion and discharge, sore throat, cough, headache, tiredness

**9. What are Protozoan diseases? Explain them briefly**

**Malaria**

○ Pathogen − Plasmodium sps. (P.vivax, P. falciparum, P. malaria)

○ Vector − Female Anopheles mosquito

○ Symptoms − High grade fever, chills

**Amoebiasis**

○ Pathogen − Entamoeba histolytica

○ Vector − Housefly

○ Site of infection − Large intestine

○ Symptoms − Constipation, abdominal pain, cramps, stools with mucus, and blood clots.

**10. What are the fungal diseases? Explain them briefly**

**Ringworms**

○ Pathogens − Genera Microsporum, Trichophyton, and Epidermophyton

○ Spreads through − Towels, clothes, comb (Fungus is acquired from soil)

○ Symptoms − Appearance of dry, scaly lesions on various body parts with intense itching

**11. What are the diseases caused by worms? Explain them briefly**

**Diseases Caused by Worms**

● Ascariasis

○ Pathogen − Round worm, Ascaris

○ Spreads through − Water, vegetables, fruits contaminated by feces of infected person

○ Symptoms − Internal bleeding, muscular pain, fever, anemia, blockage of intestinal passage

Elephantiasis (filariasis)

○ Pathogen − Wuchereria (W.malayi and W.bancrofti)

○ Spreads through − Bite of female mosquito vector

○ Symptom − Chronic inflammation of the organs, usually the lymphatic vessels of lower limb

**12. Explain life cycle of plasmodium**

Life Cycle of Plasmodium

● Plasmodium requires two hosts to complete its life cycle.

● when a female Anopheles mosquito bites a healthy human being, it releases Plasmodium, which lives in its body as a sporozoite (infectious form).

●The parasites multiply (asexual reproduction) in the liver cells and finally burst the liver cells. Sporozoites are released in blood.

● Parasites enter RBCs and further multiply (asexual reproduction) here and finally burst RBCs also.

● Bursting of RBCs is accompanied by release of a toxic substance called hemozoin (associated with fever and chills).

● In the RBCs, only sporozoites change into gametocytes (sexual stage).

Gametocytes multiply.

● When the diseased person is bitten by a female Anopheles mosquito, gametocytes are introduced into the mosquito.

● Gametocytes fertilize and develop inside the intestine of mosquitoes to form sporozoites.

● Sporozoites are stored in the salivary glands of mosquitoes and are released into the healthy person who is bitten by this mosquito.

**Multiple choice questions:**

1) Deficiencies with which a child is born and deficiencies/defects which the child inherits from parents from birth;

a) Animals **b) Genetic disorder** c) infections d) environmental

2) Which are the parasites that enter the human body through various means, then multiply, and interfere with normal vital activities.
a) Mosquito b) insect **c) Pathogens** d) Animals

3) _____ is a bacterial disease.
**a) Typhoid** b) Malaria c) Ringworms d) Elephantiasis

4) _____ is a viral disease.

**a) Common cold** b) Amoebiasis c) Pneumonia d) Ringworms

5) _____ is a Protozoan disease.

a) Common cold b) Pneumonia c) Ringworms **d) Malaria**

6) _____ is a fungal disease

a) Amoebiasis b) Pneumonia **c) Ringworms** d) Elephantiasis

7) Disease caused by worms.

**a) Elephantiasis** b) Amoebiasis c) Ringworms d) Common cold

8) _____ is an infectious disease.

a) Heart diseases **b) AIDS** c) Diabetes d) Cancer

9) _____ is a non-infectious disease.

a) **Cancer** b) Common cold c)Cholera d) dengue fever

10) What is the scientific name of the pathogen that causes Typhoid?

a) Entamoeba histolytica **b) Salmonella typhi** c) Rhino viruses d) Plasmodium

11) Name the disease caused by Entamoeba histolytica in man.

a) Ringworms **b) Amoebiasis** c) Ascariasis d) Malaria

12) Name a disease you have studied with symptoms like stools with excess mucus and blood clots, abdominal pain, cramps and constipation.

a) Typhoid b) Ascariasis **c) Amoebiasis** d) Ringworms

13) Write the scientific name of the pathogen that causes ascariasis.

a) Rhino viruses b) Wuchereria c) Trichophyton **d) Ascaris**

14) Name the disease caused by Rhinoviruses

a) Malaria b) Ringworms c) Amoebiasis **d) common cold**

15) Best Example for Proper waste disposal and control of vector

a) Soil pollution **b) Biogas generation** c) Air pollution d) water pollution

16) Confirmatory test name for typhoid _____

a) Ultrasound b) Fluoroscopy **c) widal test** d) CT scan

17) Fever, chills, cough, headache, lips and nails become gray in severe cases - These are the symptoms of _____

a) Amoebiasis **b) Pneumonia** c) Typhoid d) Malaria

18) Name the disease diagnosed by widal test

a) Amoebiasis b) Ascariasis c) Malaria **d) Typhoid**

19) Write the scientific name of the pathogen that causes malaria

**a) Plasmodium** b) Rhino viruses c**)** Entamoeba histolytica d) Ascaris

20) Name the pathogens diseases caused by pneumonia.

**a) Streptococcus pneumoniae and Haemophilus influenzae** b) Salmonella typhi c) Entamoeba histolytica d) Rhino viruses

21) Name the pathogens diseases caused by Elephantiasis

a) Plasmodium b) **Wuchereria** c) Entamoeba histolytica d) Trichophyton

22) Internal bleeding, muscular pain, fever, anaemia, blockage of intestinal passage these are the symptoms of

a)Typhoid b) Elephantiasis **c) Ascariasis** d) Amoebiasis

23) Example for fungal disease

a) Amoebiasis **b) Ringworms** c) Malaria d) Common cold

24) Example for protozoan disease.

a) Pneumonia b) Ascariasis **c) Amoebiasis** d) Ringworms

25) Example for Bacterial disease.

a) Malaria b) Amoebiasis c) Ascariasis **d) Typhoid**

a)

b)

c)

d)

a)

b)

c)

d)