

Students Learning Outcomes

After Studying this chapter, students will be able to:

- Describe infectious and non-infectious diseases and their types with examples.
- Define zoonotic diseases and give their types.
- Describe vector borne diseases with examples.
- Enlist allergies with some common types.

Subjective Type Questions

Long Questions prepared in the light of new Examination Techniques
(Knowledge, Understanding, Application, Analytical & Conceptual)

9.1

Disease

Q1. Define disease. Describe infectious diseases with examples.

Ans. Disease:

Disease is defined as a specific condition that affects the normal functioning of the body or mind.

- (i) Infectious diseases (ii) Non-infectious diseases

(i) Infectious Diseases (infections): infections disease are the communicable diseases that can spread from person to person or from the environment to person. Infectious diseases results from harmful organisms (pathogens) entering the body.

Q. What is health according to WHO?

Ans. According to the world health Organization (WHO), "health is a state of complete physical, mental, and social well-being and not merely the absence of disease or illness".

Biological agents responsible for infectious diseases:

Pathogens responsible for infectious diseases are viruses, bacteria, fungi, parasitic protozoans (e.g. plasmodium) and worms (e.g. tape worms).

Transmission of infectious diseases: Infectious diseases spread from person to person through contaminated food, water or bug bites.

Types of infectious diseases:

Following are the types of infectious diseases categorized by the specific pathogen:

- Viral Infections:** Hepatitis, flu, dengue, measles, HIV and COVID-19.
- Bacterial Infections:** Typhoid, strep throat, cholera, tuberculosis.
- Fungal Infections:** Candidiasis (yeast infection).
- Infections by Parasitic Protozoan:** Malaria, Amoebiasis.
- Infections by parasitic worms:** Round worm, tape worm infections.

Q.2. What are non infectious disease? Give examples.

Ans. Non-infectious diseases: Non-infectious diseases are non-communicable diseases. They do not transmit from one person to others.

Causes of non-infectious diseases: Such diseases result from heredity, unhealthy life styles, environmental factors, aging etc.

Q. What do you know about localized and systemic infections?

Ans. Infections can be localized (e.g., skin infection) and systemic (affecting multiple organs).

(i) **Life style and mental health diseases:** Many non-infectious diseases develop due to unhealthy life style. These include heart diseases, hypertension, diabetes, cancer and stroke. Mental health diseases like depression are also included in this category.

(ii) **Genetic disease:** Genetic diseases are caused by abnormalities in genes or chromosomes. Examples include haemophilia, thalassemia and muscular dystrophy.

(iii) **Degenerative diseases:** Some non-infectious diseases results from the gradual decline of body organs or tissues due to aging or other factors. Examples include Alzheimer's disease, parkinson disease and arthritis.

Q. How overuse of antibiotics is harmful?

Ans. Overuse of antibiotics by people has caused resistance in many bacteria. It is a major health risk.

Q3. Discuss zoonotic diseases with the help of examples.

Ans. Zoonotic Disease:

An infectious disease that is naturally transmitted from animals to humans is called zoonotic disease.

Zoonotic Pathogens: Zoonotic pathogens may be bacteria, virus or other parasites. Humans can get zoonotic pathogens through direct contact with animals or through food, water or the environment.

Examples of zoonosis include:

(i) **Anthrax:** It is caused by bacterium *Bacillus anthracis*. The infection site may be skin, lungs or digestive system.

Transmission of Anthrax: Anthrax is transmitted to humans through contact with contaminated animal products (e.g wool, hides). Usually, anthrax bacteria enter the body through a wound in the skin, by eating contaminated meat or inhaling the spores of bacteria.

(ii) **Bird-flu (Avian Influenza):** It is caused by influenza a virus. The infection site includes nose, throat and lungs. Humans get bird flu through close contact with infected birds.

(iii) **Ebola:** It is caused by Ebola virus which targets sites in the body including liver, immune system and blood vessels.

Transmission of Ebola: The virus spreads through direct contact with body fluids, such as blood from infected humans and animals. It also spread from contact with contaminated objects.



Bacillus anthracis



Influenza A virus



Ebola Virus

Causative agents of Anthrax, Bird flu and Ebola

Q. Which zoonotic disease become human only disease?

Ans. Some diseases, such as AIDS, began as a zoonosis but later became human-only diseases.

Q4. Describe vector-Borne diseases with examples.

Ans. Vector-Borne Diseases:

These are the infections that are transmitted by vectors i.e., living organisms to carry pathogens from one host to another.



Anopheles mosquito



Aedes mosquito



Ixodes ticks



Haemagogus mosquito

Causes: These diseases can be caused by bacteria, viruses or other parasites.

Examples of vector-borne diseases:

(i) **Malaria:** It is caused by a parasitic protozoan (Plasmodium). It primarily affects liver and then the RBCs. If untreated, it can lead to organ damage. It spreads from one human to other through Anopheles mosquito.

(ii) **Dengue Fever:** It is caused by Dengue virus that transmits through Aedes mosquito. Dengue fever affects multiple organs, including skin, blood vessels, and lymph nodes.

(iii) **Lyme Disease:** It is caused by bacteria *Borrelia burgdorferi* which spread through ticks. The infection affects the skin, joints, and nervous system.

(iv) **Yellow Fever:** It is an infection caused by yellow fever virus that spreads through Aedes or Haemagogus mosquitoes. The infection initially affects the liver, then involves the kidneys, heart, and nervous system.

Q5. What is allergy? Write name different types of allergy.

Ans. Allergy:

An allergy is an abnormal immunological response of the body against a foreign substance that's typically not harmful to the body.

Allergens: The foreign substances which cause allergies are called allergens. Common allergens include pollen, dust mites, certain foods, insect stings and certain medicines.

Type of allergies:

There are five types of allergies

- (i) Respiratory allergies (ii) Skin allergies (iii) Food allergies
(iv) Insect sting allergies (v) Drug allergies

Q.6. Briefly explain Respiratory allergies and skin allergies.

Ans. Respiratory allergies:

- **Allergic Rhinitis (Hay Fever):** It is caused by airborne allergens like pollen, dust mites etc. Symptoms include sneezing, itching, nasal congestion and runny nose.

Q. Are diabetes and cancer caused only by life style?

Ans. Diabetes and cancers are not solely due to lifestyle choices. These diseases also have genetic basis. Lifestyle choices can however, delay the onset of such diseases.

- **Asthma:** A chronic condition where various allergens (ammonia, latex pesticides, fumes, metal or wood dusts etc) trigger inflammation and narrowing of the air ways. It leads to wheezing, shortness of breath, chest tightness and coughing.

Skin Allergies:

- **Eczema (Atopic Dermatitis)** - Chronic skin condition characterized by itchy, inflamed patches of skin. Several allergens can trigger eczema. For example, dust mites, pollen, pet skin flakes, mold spores, certain fabrics, metals etc.
- **Contact Dermatitis** - Skin reaction resulting from direct contact with allergens like nickel, latex, or certain plants. Symptoms include redness, itching, and blisters.

Q.7. Write short note on following.

- **Food Allergies**
- **Insect Sting Allergies**
- **Drug Allergies:**

Food Allergies:

- **Common Food Allergies** - Range from mild (itching and swelling) to severe (difficult breathing, loss of consciousness etc.). Allergens may be peanuts, tree nuts, shellfish, fish, milk, eggs, soy, and wheat.

Insect Sting Allergies:

- **Venom Allergens** - Bee, wasp, and ant stings can trigger allergic reactions e.g., local pain and swelling, hives, and in severe cases, anaphylaxis.

Drug Allergies:

- **Common Drugs Allergies** - Range from mild rashes and itching to severe anaphylactic reactions. Allergens may be certain antibiotics aspirin, and Non-Steroidal Anti-Inflammatory Drugs (NSAIDs).

9.2

Pathogens

Q8. Define pathogens and write down various ways they can be transmitted to humans.

Ans. Pathogen:

A pathogen is a microorganism or agent that causes disease in its host. Pathogens include viruses, bacteria, fungi and other parasites like plasmodium.

Transmission of pathogens: Contact Pathogens can spread to humans through the five main ways:

- | | | |
|-----------------------|----------------------|-------------|
| (i) Air | (ii) Food | (iii) Water |
| (iv) Person-to-person | (v) Bites of animals | |

Q.9 Classify the types of Pathogens. Give examples, the disease caused and modes of transmission.

Ans.

Type of Pathogen	Example	Disease Caused	Common Transmission Method
Virus	Influenza Virus	Influenza (Flu)	Airborne droplets Direct contact
	Human Immunodeficiency Virus (HIV)	AIDS	Sexual contact Blood transfusion Shared needles
	SARS-CoV-2	COVID-19	Airborne droplets Surface contact
Bacteria	<i>Streptococcus pyogenes</i>	Strep Throat	Respiratory droplets Direct contact
	<i>Mycobacterium tuberculosis</i>	Tuberculosis (TB)	Airborne droplets
	<i>Escherichia coli</i>	Food Poisoning	Contaminated food/ water
Fungi	<i>Candida albicans</i>	Candidiasis (Yeast Infection)	Fungal growth in warm, moist areas Direct contact
	<i>Tinea pedis</i>	Athlete's Foot	Contaminated surfaces
	<i>Aspergillus fumigatus</i>	Aspergillosis	Inhalation of fungal spores
Parasitic Protists	<i>Plasmodium falciparum</i>	Malaria	<i>Anopheles</i> mosquito bites
	<i>Giardia lamblia</i>	Giardiasis	Contaminated water Contaminated food
	<i>Entamoeba histolytica</i>	Amoebiasis	Contaminated food/water

9.3

Immunity

Q10. Describe the roles of T-cells and B-cells in immunity.

Ans. T-cells and B-cells are the primary components of acquired immunity also known as third line of defence. While both are types of lymphocytes.

(i) T-cells: The direct attackers and regulators. T-cells are a type of white blood cell involved in non-specific and specific cellular responses.

Natural killer cells: These are a specific type of T-lymphocytes that acts in the second line of defence. They kill body cells that have been infected by pathogens and also detect and kill cancer cells.

Cellular Interaction: Unlike B-cells some T-cells directly interact with infected cells to eliminate threats.

Response to fever: The activity of these and other phagocytes increases during a fever, which helps to slow down bacterial and viral growth.

(ii) **B-cells the antibody producers:** B-cells are central to active immunity, which is a component of the body's third line of defence.

The primary role of B-cells is to prepare antibodies. These antibodies are specialized proteins designed to target and kill specific pathogens.

Active immunity: This process occurs during active immunity which can be acquired naturally or artificially through vaccination.

Contrast with passive immunity: B-cells create long-lasting active immunity, "passive immunity" involves being get ready-made antibodies, which provides only short lived protection.

Q.11. Write a note on First line of Defence.

Ans. First Line of Defence

It is nonspecific defence against any pathogen, regardless of the pathogen's identity. It includes the skin and mucous membranes.

(i) Skin serves as a physical barrier to pathogens. In addition, the oil and sweat glands present in skin inhibit the growth of many microbes.

(ii) Mucous membranes are epithelial tissues that protect the interior surfaces of the body e.g., respiratory and digestive systems, the urethra. Mucous membranes secrete mucus that traps pathogens.

Q.12. Define Immunity. Write down types of Immunity.

Ans. Immunity is the ability of the body to defend itself against disease-causing organisms. The following are the types of immunity:

(i) **Innate Immunity:** This type of immunity is present in body by birth. It includes the first line of defence and second line of defence.

(ii) **Acquired Immunity:** It is acquired during life time. It includes the third line of defence.

Q.13. Explain Second line of Defence in detail.

Ans. Second Line of Defence:

The second line is also a non-specific defence. It includes:

(i) **Killer cells of blood:** move through the blood stream to detect and destroy pathogens. For example:

- **Macrophages** develop from monocytes (a type of WBCs). They ingest bacteria and kill them.

- **Neutrophils** are a type of WBCs. They do phagocytosis (engulfing the pathogen and killing it). They also release killing chemicals on pathogens. They also release network of fibres which bind with pathogens and kill them.

- **Natural killer cells** are a type of T-lymphocytes. They kill the body cells that are infected by pathogens. They also detect and kill cancer cells.



A macrophage attacking microbes

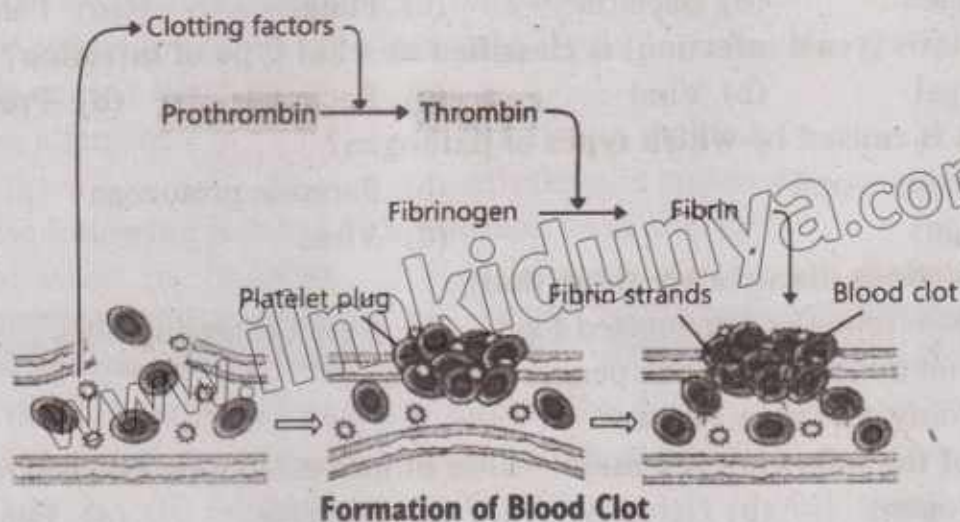
- (ii) **Protective proteins** also provide non-specific defences. For example:
- **Special proteins** form a ring-shaped structure that punctures the membranes of infected cells, causing the cells to die.
 - **Interferon** is another protective protein. It is released by cells infected with viruses. Interferon causes nearby cells to make a protein that helps them resist viral infection.
- (iii) **Inflammation:** Infected or injured cells release chemicals called histamines which cause local expansion of blood vessels. It results in heat, redness and swelling. This condition is called inflammation. This response is often strong enough to stop the spread of microbes.
- (iv) **Fever:** Fever is also a second line of defence. When macrophages attack the pathogens, they release chemicals called pyrogens in blood. When pyrogens reach the brain, the temperature regulating part of the brain raises the body's temperature above the normal value of 37°C (98.6°F). It results in the rise in body temperature. The higher-than-normal body temperature is known as fever. It increases the activity of phagocytes and slows bacterial and viral growth.

Q14. Write a note on blood clotting.

Ans. Blood Clotting:

Blood clotting, or coagulation, is a process that prevents excessive bleeding when a blood vessel is injured. The following are the main steps:

- When a blood vessel is injured, the exposed collagen fibres activate the blood platelets. Activated platelets adhere to the collagen and the damaged walls of blood vessel. In this way, a temporary "platelet plug" is formed.
- Platelets release special proteins called clotting factors which convert prothrombin (a plasma protein), into thrombin.
- Thrombin converts fibrinogen, another plasma protein, into fibrin strands. Fibrin strands weave through the platelet plug, forming a blood clot.
- Platelets within the clot contract and reduce the size of wound. Once the vessel is repaired. A plasma protein breaks down the fibrin clot, dissolving the clot and restoring normal blood flow.



Objective Type Questions

Additional MCQ's

Multiple Choice Questions prepared in the light of new Examination Techniques
(Knowledge, Understanding, Application, Analytical & Conceptual)

9.1

Disease

1. According to WHO which is a state of complete physical, mental and social well-being?
(a) Health (b) Disease (c) Disorder (d) Syndrome
2. A specific condition that affects the normal functioning of the body or mind is defined as:
(a) Symptom (b) Pathogen (c) Health (d) Disease
3. Diseases include:
(a) Infections (b) Metabolic disorders
(c) Auto immune diseases (d) All of these
4. The term "illness" refer to:
(a) The biological cause of a virus
(b) The individual's subjective experience of being unwell
(c) A localized skin infection only
(d) The genetic basis of a condition
5. Infectious diseases are also known as:
(a) Non-communicable diseases (b) Hereditary diseases
(c) Communicable diseases (d) Lifestyle diseases
6. Which of the following is an example of a viral infection?
(a) Typhoid (b) Cholera (c) COVID-19 (d) Malaria
7. Typhoid and tuberculosis are examples of infections caused by:
(a) Viruses (b) Bacteria (c) Fungi (d) Parasitic worms
8. Candidiasis (yeast infection) is classified as what type of infection?
(a) Fungal (b) Viral (c) Bacterial (d) Protozoan
9. Malaria is caused by which types of pathogen?
(a) Parasitic worm (b) Parasitic protozoan
(c) Fungus (d) Virus
10. Non-infectious diseases are those that:
(a) Spread through contaminated food (b) Result from bug bites
(c) Do not transmit from one person to others
(d) Are only caused by viruses
11. Which of the following is a major cause of non-infectious diseases?
(a) Pathogens (b) Heredity (c) Bacteria (d) Fungi

12. Which of these is NOT solely due to lifestyle choices but also have a genetic basis?
- (a) Flu (b) Diabetes and cancers
(c) Measles (d) Cholera
13. Depression is categorized as:
- (a) Viral infection (b) Bacterial infection
(c) Mental health disease (d) Communicable disease
14. Infectious diseases can spread through all of the following EXCEPT:
- (a) Contaminated water (b) Bug bites
(c) Genetic inheritance (d) Person-to-person contact
15. Genetic diseases are primarily caused by abnormalities in:
- (a) Bacterial infections (b) Genes or chromosomes
(c) Lifestyle choices (d) Fungal pathogens
16. Which is an example of genetic disease?
- (a) Alzheimer's (b) Arthritis (c) Thalassemia (d) Anthrax
17. A zoonotic disease is one that is naturally transmitted from:
- (a) Humans to humans (b) Plants to humans
(c) Animals to humans (d) Soil to plants
18. Which bacterium is responsible for causing anthrax?
- (a) Borelli burdorferi (b) Bacillus anthracis
(c) Plasmodium (d) Influenza
19. Living organisms that carry pathogens from one host to another are called:
- (a) Allergens (b) Vectors (c) Antibodies (d) Hormones
20. Malaria is caused by a parasitic protozoan called:
- (a) Aedes (b) Ixodes (c) Plasmodium (d) Haemagogus
21. Which mosquito is the primary vector for dengue fever?
- (a) Anopheles (b) Aedes (c) Haemogogus (d) Culex
22. Lyme disease is transmitted to humans through the bite of:
- (a) Birds (b) Ticks (Ixodes) (c) Bees (d) Bats
23. Which organs are initially affected by the yellow fever virus?
- (a) Skin and joints (b) Heart and lungs (c) Liver (d) Immune system
24. Hay fever is caused by:
- (a) Airborne allergens (b) Eating shellfish
(c) Bee stings (d) Genetic mutations
25. Which of the following is listed as a common food allergy?
- (a) Distilled water (b) Shellfish (c) Cooked rice (d) Bananas

9.2

Pathogens

9.3

Immunity

26. Which of the following diseases is caused by a fungus and is commonly transmitted through contact with contaminated surfaces?
- (a) COVID-19 (b) Athlete's foot (c) fever (d) throat infection

27. Which of the following are categorized as "parasitic protists"?
- SAR-COV-2 and HIV
 - Aspergillus fumigatus and Tinea pedis
 - Giardia lamblia and Entamoeba histolytica
 - Mycobacterium tuberculosis and E.coli
28. AIDs and COVID-19 can be transmitted through:
- Contaminated water
 - Mosquito bites
 - Bee'sdung
 - Direct contact or droplets
29. _____ is the ability of the body to defend itself against disease causing organisms.
- Syndrome
 - Disease
 - Pathogen
 - Immunity
30. Which type of immunity is present in body by birth?
- Acquired immunity
 - Innate immunity
 - Both (a) and (b)
 - None of these
31. Innate immunity includes:
- First line of defence
 - Second line of defence
 - Third line of defence
 - Both (a) and (b)
32. Which type of immunity acquired during life time?
- Acquired immunity
 - Innate immunity
 - Active immunity
 - Passive immunity
33. The "First Line of Defence" in the human immune system includes physical barriers such as:
- Macrophages and neutrophils
 - Skin and mucous membranes
 - Antibodies and B-cells
 - Interferon and pyrogens
34. The role of mucus in the mucous membrane is:
- To treat diseases
 - To trap pathogens
 - To insulate skin
 - To ingest bacteria
35. Natural killer cells specifically targets:
- Healthy red blood cells
 - Pathogen-infected cells and cancer cells
 - Mucous membranes
 - Blood platelets
36. Inflammation results in heat, redness and swelling due to release of:
- Pyrogens
 - Histamines
 - Antibodies
 - Collagen
37. The third line of defence is also known as:
- Innate immunity
 - Acquired immunity
 - Physical barrier
 - Passive immunity
38. Active immunity can be developed naturally or artificially through:
- Antibiotics
 - Vaccination
 - Blood clotting
 - Histamine release
39. Which of the following is a component of the third line of defence?
- Skin
 - B-cells and antibodies

- (c) Mucous membranes (d) Inflammation
40. What is the purpose of coagulation?
 (a) Carry oxygen (b) Prevent excessive bleeding
 (c) Fight viruses (d) Produce platelets
41. Which protein convert prothrombin into thrombin?
 (a) Progens (b) Clotting factors (c) Histamines (d) Interferones
42. Thrombin's main role is to convert:
 (a) Platelets into collagen (b) Fibrinogen into fibrin stands
 (c) Fibrin into prothrombin (d) Blood into plasma

Answers

- | | | | | | |
|---------|---------|---------|---------|---------|---------|
| 1. (a) | 2. (d) | 3. (d) | 4. (b) | 5. (c) | 6. (c) |
| 7. (b) | 8. (a) | 9. (b) | 10. (c) | 11. (b) | 12. (b) |
| 13. (c) | 14. (c) | 15. (b) | 16. (c) | 17. (c) | 18. (b) |
| 19. (b) | 20. (c) | 21. (b) | 22. (b) | 23. (c) | 24. (a) |
| 25. (b) | 26. (b) | 27. (c) | 28. (d) | 29. (d) | 30. (b) |
| 31. (d) | 32. (a) | 33. (b) | 34. (b) | 35. (b) | 36. (b) |
| 37. (b) | 38. (b) | 39. (b) | 40. (b) | 41. (b) | 42. (b) |

Additional Short Questions

Short Answer Questions prepared in the light of new Examination Techniques
 (Knowledge, Understanding, Application, Analytical & Conceptual)

9.1

Disease

1. How would you differentiate between disease and illness?

Ans. Disease: Disease is a specific condition that affects the normal functioning of the body or mind.

Examples: Examples of diseases include infectious, metabolic disorders, autoimmune diseases and genetic disorders.

Illness: Illness means the subjective experience of being unwell due to disease.

This include individuals perception and response towards their health condition.

2. How many basic types of diseases are there? Name them.

Ans. There are two basic types of diseases:

- i- Infectious Diseases ii- Non-infectious Diseases

3. How infectious diseases can be transmitted?

Ans. Infectious diseases spread through contaminated food, water or bug bites.

4. What do you know about non-infectious diseases?

Ans. Non-infectious diseases: These are non-communicable diseases. They do not transmit from one person to others.

Examples: Diabetes, thalassemia and parkinson's disease are the examples of

non-infectious diseases.

5. **Through which factors non-infectious diseases can be transmitted?**

Ans. Non-infectious diseases can be transmitted due to heredity, unhealthy lifestyles, environmental factors and aging.

6. **Which non-infectious diseases develop due to unhealthy lifestyle and mental health?**

Ans. Many non-infectious diseases develop due to unhealthy lifestyle. These include heart diseases, hypertension, diabetes, cancer and stroke. Mental health diseases include depression.

7. **Name the diseases occurs due to heredity and aging.**

Ans. **Non-infectious diseases due to heredity:** These diseases include haemophilia, thalassemia and muscular dystrophy.

Non-infectious diseases due to aging: These diseases include Alzheimer's disease, Parkinson's disease and arthritis.

8. **How humans can get zoonotic pathogens?**

Ans. Humans can get zoonotic pathogens through direct contact with animals or through food, water or the environment.

9. **Discuss Avian Influenza.**

Ans. Avian influenza is also called bird flu. It is caused by influenza A virus. The infection site include nose, throat and lungs. Humans get bird flu through close contact with infected birds.

10. **What are vectors?**

Ans. Vectors are the living organisms that carry pathogens from one host to another.

11. **Write down the examples of vector-Borne diseases.**

Ans. Examples of vector-borne diseases include Malaria, Dengue Fever, Lyme disease and yellow fever.

12. **Write a note on yellow fever.**

Ans. Yellow fever is an infection caused by yellow fever virus that spreads through Aedes or Haemogogus mosquitoes. The infection initially affects the liver, then involves the kidneys, heart and nervous system.

13. **Which bacteria causes Lyme disease?**

Ans. Lyme disease is caused by bacteria *Borrelia burgdorferi* which spread through ticks.

14. **Discuss insect sting allergies.**

Ans. **Venom Allergens:** Bee, wasp and ant stings can trigger allergic reactions e.g. local pain and swelling, hives and in severe cases anaphylaxis.

9.2

Pathogens

9.3

Immunity

15. **Define a pathogen and list two examples of different types.**

Ans. **Pathogens:** A pathogen is a microorganism or agent that causes diseases in its host.

Examples of pathogens: Pathogens include virus, bacteria and fungi.

16. Identify two bacterial pathogens and the specific diseases they cause.

Ans. The bacterial pathogens are mycobacterium tuberculosis which cause tuberculosis (TB) and Escherichia coli which cause food poisoning.

9.3

Immunity

17. What is immunity?

Ans. Immunity: Immunity is the ability of the body to defend itself against disease causing organisms.

18. Differentiate between the roles of macrophages and neutrophils in the defence mechanism.

Ans. Macrophages: Macrophages develop from monocytes (a type of WBCs). They ingest bacteria and kill them.

Neutrophils: Neutrophils are a type of WBCs. They do phagocytosis. They also release killing chemicals on pathogens. They also release network of fibres which bind with pathogens and kill them.

19. What is an "interferon", and how does it help nearby cells?

Ans. Interferon is a protective protein. It is released by cells infected with viruses. Interferon causes nearby cells to make a protein that helps them resist viral infection.

20. Differentiate between active immunity and passive immunity.

Ans. Active immunity: In active immunity a type of lymphocytes called B-cells prepare antibodies to kill the pathogen. It may be a natural or artificial (vaccination).

Passive Immunity: In passive immunity, the individual is given antibodies to combat specific microbes. Passive immunity is short-lived.

35. Define blood clotting.

Ans. Blood clotting or coagulation, is a process that prevent excessive bleeding when a blood vessel is injured.

Exercise Questions (Solved)



A. Select the correct answers for the following questions.

1. A doctor finds bacteria in a patient's blood sample. What type of disease is the patient suffering from?

(a) Infectious disease

(b) Non-infectious disease

(c) Genetic disorder

(d) Nutritional deficiency

2. Which of the following is an example of an infectious disease?

(a) Diabetes

(b) Hypertension

(c) Influenza

(d) Osteoporosis

3. A person develops rabies after being bitten by a dog. This is an example of:

(a) Non-infectious disease

(b) Food-borne illness

(c) Zoonotic disease

(d) Genetic disorder

4. Which of the following is a vector-borne disease?

(a) AIDS

(b) Malaria

(c) Tuberculosis

(d) Diabetes

5. A person develops dengue fever after a mosquito bite. In this case, the mosquito acts as:
 (a) Host (b) Pathogen (c) Vector (d) Reservoir
6. Which of the following is the first line of defence against pathogens?
 (a) Antibodies (b) Skin and mucous membranes
 (c) T cells (d) B cells
7. Skin is categorized as;
 (a) Non-specific defence (b) Specific defence
 (c) Acquired immunity (d) Passive Immunity
8. What triggers an allergic reaction?
 (a) Pathogens (b) Allergens (c) Antigens (d) Antibodies

Answers

1. (a) 2. (c) 3. (c) 4. (b) 5. (c)
 6. (b) 7. (a) 8. (b)

B. Write short answers.

1. Define infectious diseases.

Ans. Infectious diseases: Infectious diseases are communicable diseases. They can spread from person to person or from the environment to person. Infectious diseases result from pathogens entering the body.

Examples: Hepatitis, typhoid and malaria are infectious diseases.

2. Define zoonotic diseases. Also give examples

Ans. Zoonotic Diseases: An infectious disease that is naturally transmitted from animals to humans is called zoonotic disease.

Examples: Examples of zoonosis include anthrax, bird flu and ebola.

3. Enlist allergies with some common types.

Ans. Allergy: An allergy is an abnormal immunological response of the body against a foreign substance that's typically not harmful to the body.

Types of Allergies:

Types of allergies are:

- (i) Respiratory Allergies (ii) Skin Allergies (iii) Food Allergies
 (iv) Insect sting Allergies (v) Drug Allergies

4. Differentiate between innate and acquired immunity.

Ans. Innate Immunity: This type of immunity is present in body by birth. It includes the first line of defence and second line of defence.

Acquired Immunity: It is acquired during life time. It includes the third line of defence.

5. Describe the role of skin as a component of defence system.

Ans. Skin serves as a physical barrier to pathogens. In addition, the oil and sweat glands present in skin inhibit the growth of many microbes.

6. State the role of mucous membranes in defence.

Ans. Mucous membranes are epithelial tissues that protect the interior surfaces of the

body e.g. respiratory and digestive systems, the urethra. Mucous membranes secrete mucus that traps pathogens.

C. Write answers in detail.

1. **Describe infectious and non-infectious diseases and their types with examples.**

Ans. See Q.1 and 2 for answer

2. **Describe vector borne diseases with examples.**

Ans. See Q.4 for answer

3. **Describe the roles of T-cells and B-cells in immunity.**

Ans. See Q.10 for answer

4. **Write a note on blood clotting.**

Ans. See Q.14 for answer

D. Inquisitive questions

1- **Why do infectious diseases spread faster in crowded places?**

Ans. Infectious diseases spread rapidly in crowded environments because pathogens have more opportunities to move from person-to-person.

Modes of transmission: Many pathogens like influenza virus or mycobacterium tuberculosis are spread through airborne droplets released when an infected person cough or sneezes. In a crowd, these droplets are easily inhaled by others nearby.

Direct and surface contact: Crowded places increase direct person-to-person contact or surface touching (like doors handles) which are common transmission method.

2- **How can genetics increase a person's risk of developing non-infectious diseases?**

Ans. Genetics can increase a person's risk of developing non-infectious diseases when faulty or mutated genes are passed from parents to their children. These genes may make the body more prone to problems such as high blood pressure, weak metabolism or uncontrolled cell growth. As a result, a person with these inherited genes has a higher chance to developing conditions like diabetes, hypertension or cancer.

Not only the genes increase the risk of diseases, the disease usually develop when genetic factors combine with unhealthy lifestyle or environmental factors.

3- **Why do some people develop allergies while others do not??**

Ans. Some people develop allergies while others do not because their immune systems react differently to certain substances. Some people get allergies because their immune system is extra sensitive often due to inherited genes from their parents. Their body overreacts to harmless things like dust or pollen. Other do not develop allergies because they do not have this sensitivity. Environment and exposure to allergens can also affect who develops allergies.

