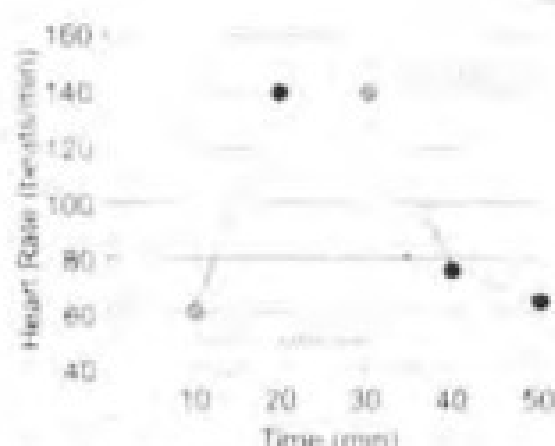


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3. Anum measures her pulse rate before the exercises. It is 60 beats per minute. She exercises for twenty minutes and measures her pulse rate again. She then measures it every minute for several minutes. She draws a graph to show her results.

Ans:



- a. Why does her pulse rate keep on increasing during exercise?

Ans: Because her heart starts pumping faster, which makes for a quicker pulse. Meanwhile her lungs are also taking in more air, hence the harder breathing.

- b. After how many minutes does her pulse rate return to normal?

Ans: If heart rate decreases 20 beats per minutes (bpm) or more within one minute post exercise she doing well.

- c. What can be concluded from her results?

Ans: During exercise heart rate increased and return to normal if heart rate decrease 20 (bpm).

E. Project Work

With the help of recycled material make the model of the circulatory system or respiratory system.

Ans: Practical work.

3

IMMUNITY AND DISEASES

Questions and Activities

- A. MCQs (Choose the correct option)

1. When the skin is damaged, bacteria enter in our body. Which line of defence is crossed by these bacteria?

- First line of defence
- Second line of defence
- Third line of defence
- Fourth line of defence

Ans: a. First line of defence

2. A new born baby has less immunity as compared to other people. The baby has only:

- innate immunity
- Adaptive immunity
- Passive immunity
- Innate and natural passive immunity

Ans: a. innate immunity

3. The Army of your body has special bullets which can identify the enemy and kill it. These bullets are small proteins called:

- Pathogens
- Antibodies
- Virus
- Bacteria

Ans: b. Antibodies

4. Third line of defence learns about the enemy and adapts accordingly. It is also called

- adaptive/ learned immunity
- innate immunity

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- c. passive immunity
d. natural passive immunity
Ans: a. adaptive / learned immunity
5. **Banish is allergic to dust and pollen. Her Health issue is a/an**
a. infectious disease
b. disease due to pathogen
c. viral attack
d. non infectious disease
Ans: d. non infectious disease
6. **Rabies is a very serious threat to health and life of a person. If a rabies infected dog bites a person, the only way to save him is by providing**
a. innate immunity
b. adaptive immunity
c. passive immunity
d. learned immunity
Ans: c. passive immunity
7. **Maximum number of additional defence layers is required for**
a. medical staff b. teachers
c. students d. lawyers
Ans: a. medical staff
8. **Typhoid and polio spread by faecal oral route. If we want to prevent such diseases in our area we should**
a. control mosquitoes
b. control air pollution
c. improve hospitals
d. improve sanitation and hygiene condition.
Ans: d. improve sanitation and hygiene condition.
9. **Respiratory system related disease mostly spread through**
a. water b. food
c. blood d. droplets in air
Ans: d. droplets in air

10. **Which of these can provide you with long term immunity against infectious diseases?**
a. Antibiotics b. Vitamins
c. Vaccines d. Red blood cells
Ans: a. Antibiotics
- B. Short Questions**
1. **Which line of defence acts last in immune response? List its components?**
Ans: The first line of defense against non-self-pathogens is the innate or non-specific immune response. The innate immune response consists of physicals chemical and cellular defenses against pathogen.
2. **Which line/s of defence is /are not concerned with recognition of the pathogen intruder?**
Ans: Innate immunity or non-specific immunity is the natural defense of body against intruder. This immunity acts without recognizing and differentiating the intruder. It has two components i-e first line of defense and second line of defence.
3. **Some harmful chemicals can make you sick but chemicals are not included in the list of pathogens. Why?**
Ans: Because Pathogens are living things while chemicals are not living things.
4. **Adaptive immune response increase with time. Why?**
Ans: Adaptive immune response increase with time due to vaccine and exposure of pathogens.

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5. People throughout the world have become focused on improving immune system from March, 2020. Why?

Ans: People throughout the world have become focused on improving immune system from March 2020 because a very danger disease Covid-19 spread out in the whole world.

C. Long Questions

1. Explain different types of immunity.

Ans: Three types of immunity in humans are innate, adaptive and passive immunity.

1. Innate Immunity

Innate Immunity or nonspecific immunity is the natural defense of body against any intruder. This immunity acts without recognizing and differentiating the intruder. It was two components i.e, first line of defense and second line of defense. Every one has innate immunity by births.

2. Adaptive Immunity

Adaptive Immunity or learned immunity including the third line of defense. It identifies the germ and start making special types of white blood cells i.e, T cells and B cells T cells directly Kill virus infected cells and bacteria and activate all other cells of immune system to fight the germs. B Cells after activation start making antibodies. This immunity grows with time due to vaccine and exposure of pathogens.

3. Passive Immunity

Some Times a pathogen or toxin harms body very quickly and immune system cannot protect the body. In such situation already prepared antibodies can save person's life. We get this immunity naturally from our mother.

We can help our immune system adding additional layers of defense (such as wearing masks, using sanitizers etc.)

2. Explain the mechanism of antibody formation.

Ans: There are two ways to start antibody formation by your immune system. Either you get disease or you get vaccination. Your immune system requires exposure of pathogen to activate and start anti body formation.

Antibodies are produced by specialized white blood cells called B lymphocytes (or B cells). When an antigen binds binds to the B-cell surface, it stimulates the B cell to divide and mature into a group identical cells called a clone.

D. Structured questions

1. Differentiate between active and passive immunization.

Ans:

1. Produced by body's own	Received passively by host, no
Received passively by host, immune system in response	involvement of immune system.
no involvement of immune to antigen.	

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2. Negative phase in which no Negative phase, immunity is transiently lowered.	No Negative phase
3. Latent period from a days. No latent period. to 4 weeks.	No latent period
4. Secondary response is more No immunological enhanced.	No immunological memory
5. Active immunity is long passive immunity is lasting short lasting.	Passive immunity is short lasting

Active Immunization

Passive Immunization



a. Which immunity is produced by a person's own immune system?

Ans: Active immunity is produced by a person's own immune system.

b. Which type of immunity is provided by already prepared antibodies?

Ans: Passive immunity is provided by already prepared antibodies.

c. Which type of immunity will protect for long period of time?

Ans: Active immunity will protected for long period of time.

1. The graph shows immune response after first and second dose of vaccination. Primary response is produced after first dose and secondary response is produced after second dose of vaccination. Analyze the graph and response.

Active Immunization

Passive Immunization



a. Which response is capable of controlling disease effectively?

Ans: Secondary response

b. Which response is slow to develop antibodies?

Ans: Secondary response

c. What is the importance of booster dose of Vaccines?

Ans: A booster dose is an additional dose or dose of a vaccine given after the protection provided by the original dose/ doses has begun to decrease over to me.

d. What will happen if the pathogen of this disease enters in the body at day 90?

Ans: Antibodies will kill the cause of disease.

e. What will happen if the pathogen of this disease enters in the body at day 0?

Ans: Patient may suffer from the disease because this Patient hasn't developed specific antibodies against this diseases.

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Activities

Activity 3.1

Role play

Imagine your class room as a human body and Students as cells and pathogens?

1. Some masked students acting as pathogens will try to enter in the class room.
2. Closed door of the class room will indicate that skin intact.
3. When door is opened it indicates injury after that pathogens will enter and try to spread in the class room.
4. Few students acting as second line of defence cells will try to stop pathogens without looking at their faces.
5. Then B cells and T cells will come near pathogens. They will take off masks and recognize the pathogens. They will take picture of pathogens and save it in Memory file.
6. T cells will directly stop pathogens and take them out of class room.
7. B cells will attach small sticky notes (antibodies) on pathogens and take them outside class room.
(Throughout role play caring and compassionate behavior among students is required)

Activity 3.2

Learn about three types of immunity

- a. Which letter will indicate the state of immunity in a new born child?

Ans: ABD

- b. Ahmed live in a village. He was playing near fields when a poisonous snake bit him. He was rushed to hospital. Doctors asked about the details of snake. Why doctors need to know about type of snake?

Ans: for better treatment

- c. Which letter will indicate his state of immunity before coming to hospital?

Ans: BDC

- d. Then Ahmed was injected with prepared antibodies. After few days he was playing again. Which letter will indicate his immunity after treatment?

Ans: ADC

Activity 3.3

Learn about Dengue fever
Dengue fever is caused by dengue virus. This disease spreads through mosquito

1. List five ways to reduce mosquito in your area.

- Ans: -
1. Maintain fly screens on windows, doors, vents and chimneys.
 2. Use insect sprays and repellents containing either Picardie's on DEET, both inside and outside the house to kill mosquitoes.
 3. Remove stagnant water around the house so mosquitoes cannot breed.
 4. Change pet drinking bowls, bird baths and vase water at least once a week.
 5. Check and maintain rain water tanks are water storage vessels.

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2. Do you think everyone in your area should know about symptoms of dengue infection? If yes explain why?

Ans: Because if everyone know the symptom of dengue infection. Then their disease can be diagnosed, and it is very easily to the treatment and care.

3. Why it is important to keep dengue patients away from mosquitoes all the time?

Ans: Dengue cannot be spread directly from person to person. However, a person infected and suffering from dengue fever can infect other mosquitoes. Due to this a dengue patients keep away from mosquitoes all the time.

4. Do you think scientist should focus on development of dengue vaccine? Why?

Ans: Unlike other highly effective vaccines developed against other flaviviruses, the development of a dengue vaccine is highly challenging due to that fact that the virus has four antigenically different sera types.

5. After development of dengue vaccine, what should be the next step of your government, hospital and people of Pakistan.

Ans: Remove stagnant water, check and maintain rain water tanks and water storage vessels. Build the dengue department in hospitals. Test the every fever patients carefully. People use mosquito repellents, mosquito

nets and killing sprays etc. Wear fully covered clothes. Drain all standing water. Sites as these are breeding area of mosquitoes.

• **Choose the correct option.**

1. Our body has a powerful army is called:

- a. Nervous system
- b. Immune system
- c. digestive system
- d. circulatory system

Ans: b. Immune system

2. Which line of defence cells eating pathogens?

- a. First line of defence
- b. Second line of defence
- c. Third line of defence
- d. None of them

Ans: b. Second line of defence

3. T-cells and B-cells are the:

- a. platelets
- b. Red blood cells
- c. white blood cells
- d. muscles cells

Ans: c. white blood cells

4. Antibodies are special

- a. Proteins
- b. fats
- c. vitamins
- d. carbohydrates

Ans: a. Proteins

5. Which one works by training the immune system to recognize and fight pathogens?

- a. Antibodies
- b. Tablets
- c. drugs
- d. vaccine

Ans: d. vaccine

6. Which type of immunity we get naturally from our mother?

- a. Passive immunity
- b. Innate immunity
- c. adaptive immunity
- d. learned immunity

Ans: a. Passive immunity

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7. Which disease is caused by bacteria?

- a. Covid-19 b. Dengue
- c. Hepatitis d. Typhoid

Ans: d. Typhoid

Shorts Questions

Give the short answer of the following questions.

1. Define Pathogens and infectious diseases.

Ans: Pathogens are disease causing germs including virus, bacteria, fungi and parasites. Infectious diseases are diseases caused by these pathogens e.g. Flu caused by virus, Typhoid caused by bacteria etc.

2. What do mean by immunity?

Ans: Immunity is the ability of the body to resist harmful microorganisms. There are three types of immunity i.e. innate, adaptive and passive immunity.

3. What is the function of T-cells and B-Cells?

Ans: T-cells and B-cells are white blood cells. T-cells directly kill virus infected cells and activates all other cells of immune system to fight the germs. B-cells attack invaders outside the cells. B-cells after activation start making antibodies.

4. Define antibodies.

Ans: Antibodies are special proteins flowing in blood which can recognize and kill viruses and bacteria.

5. What is immune response?

Ans: The way the body defends itself against harmful or foreign

substances is called immune response.

6. What do you know about vaccines?

Ans: A vaccine works by training the immune system to recognize and fight pathogens. It can be in the form of oral drops e.g. polio vaccine or injection. It makes our immune system stronger.

7. How an infant gets immunity?

Ans: An infant get passive immunity naturally from his mother. Before birth, antibodies are passed through the placenta to protect the child from illness. After birth, an infant, receives antibodies found in mother, breast milk. It is also called maternal passive immunity.

8. How to boost your immunity or immune system?

Ans: Ways To Boost Your Immunity

- a. Eat lots of fruits and vegetable.
- b. Drink plenty of water.
- c. Exercise regularly and maintain healthy weight.
- d. Get a good night's sleep.
- e. Stay hopeful, happy and connected with family and friends.
- f. Wash your hands more often and keep yourself clean.
- g. Avoid fried food, sugar, smoking, drugs etc.
- h. Get recommended vaccination.

9. How the infection diseases spread?

Ans: They commonly spread through the direct transfer of bacteria.

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viruses or other germs from one person to another. Germs can spread from person to person through 1. The air as droplets 2. Faecal oral spread (food and water) 3. Blood or other body fluids 4. Skin or mucous membrane (direct contact).

10. What is the cause and ways of spreading of Covid-19?

Ans: Cause, Covid-19 virus
SPREAD THROUGH: Direct contact, Breath droplets, coughing and sneezing.

11. What are the symptoms of Covid-19?

Ans: SYMPTOMS:
Fever, cough, cold, Body Pain, Fatigue, Respiratory difficulty, pneumonia, kidney failure.

12. Write down precautions about COVID-19?

Ans: PRECAUTIONS:
Vaccination, social distancing, face mask, use of sanitizer, wash hands with soap often and avoid crowded indoor gatherings.

13. How does the COVID-19 diagnose?

Ans: Test of sample from nose, throat or saliva to check presence of COVID-19 virus.

14. What is the cause, way of spreading and symptoms of Dengue?

Ans: Dengue caused due to dengue virus. It is spread through bite of Aedes mosquito.
SYMPTOMS are high grade fever, Severe headache, Pain

behind eyes, Nausea, Vomitus, Skin rash, Body pains and weakness.

15. What are the Precognitions and diagnostic test for Dengue?

Ans: PRECAUTIONS: Use mosquito repellents, mosquitoes net, mosquito killing sprays etc. Wear fully covered clothes. Drain all standing water sites as these are breeding area of mosquitoes.

16. What is the cause, ways of spreading and symptoms of Hepatitis-B?

Ans: This is caused by Hepatitis-B viruses. It is spread through Blood and body fluids. Multiple use of syringes, needles, razors, dental and surgical instruments Transfusion of blood.

Symptoms Low grade fever, loss of hunger, Nausea, stomach pain weakness.

17. Write down the precautions diagnostic test for Hepatitis-B?

Ans: Precautions are vaccination, single use of disposable syringes, needless etc. Proper disinfection of dental and surgical instruments Screening before blood donation Diagnostic Test Blood test for presence of Hepatitis B virus.

18. Write down the cause, ways of spreading and symptoms of Typhoid?

Ans: Typhoid is caused by salmonella typhoid bacteria. Spread through faecal oral route, Ingestion food/drink contaminated with faeces/Urine of typhoid patient.

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Symptoms are high grade fever, headache, Stomach pain, weakness, Dizziness and loss of Hunger.

19. What are precautions and diagnostic test for Typhoid?

Ans: Precautions are vaccination. Wash hands properly after using toilet and before handling food. Eat freshly prepared and properly cooked food drink boiled bottled water.

Diagnostic Test: Blood culture test for presence of typhoid Bacteria.

E. Project Work

Run a campaign to give awareness about diseases in your surroundings.

Ans: practical work

♦ ♦ ♦ ♦ ♦ ♦ ♦ ♦

4

PHYSICAL AND CHEMICAL CHANGES

Questions and Activities

A. MCQs (Choose the correct option).

1. Which of the following is an example of physical change.

- a. Mixing baking soda and vinegar
- b. Chopping of log
- c. Burning a paper with a lighter
- d. Baking a birthday cake for your mother.

Ans: b. Chopping of log

2. Which of the following is an example of chemical change?

- a. Filling up a balloon with air.
- b. Freezing of water.
- c. Photosynthesis.
- d. Boiling of water

Ans: c. Photosynthesis.

3. Which change can be easily reversed?

- a. Chemical Change
- b. Physical Change
- c. Both physical and chemical changes
- d. Neither a physical nor chemical change

Ans: b. Physical Change

4. When a new substance is formed with properties different from the ones it was formed

- a. chemical change.
- b. physical change.
- c. freezing
- d. boiling

Ans: a. chemical change.

5. If the chemical properties of a substance remain unchanged and only the state change it is called a

- a. chemical change.
- b. physical change.
- c. both physical and chemical change
- d. neither physical nor chemical change

Ans: b. physical change.

6. Which of the following is an example of a physical change?

- a. Metal rusting
- b. Silver tarnishing