

CHAPTER 7

HUMAN HEALTH AND DISEASES

VEDA
ACADEMY

CLASS 12TH

NCERT EXERCISE AND SOLUTIONS - BIOLOGY

Q. 1. What are the various public health measures, which you would suggest as safeguard against infectious diseases?

ANSWER:-

Public health measures are implemented to prevent and control the spread of infectious diseases by reducing contact with infectious agents. Key preventive steps include:

- **Isolation:** Infected individuals are isolated to limit the spread of airborne diseases such as chickenpox, pneumonia, and tuberculosis.
- **Vaccination:** Vaccines introduce agents that mimic pathogens, providing immunity and protecting against communicable diseases. Vaccines are available for diseases like mumps, polio, and measles.
- **Vector Eradication:** To prevent vector-borne diseases like dengue and malaria, measures include maintaining a clean environment, preventing water stagnation, and periodically cleaning water storage systems. Using mosquito nets, insecticides, and introducing fish like *Gambusia* in ponds to control mosquito larvae are also effective.
- **Hygiene Practices:** Maintaining personal and public hygiene is crucial. This involves keeping the body clean, consuming nutritious food, drinking clean water, and properly disposing of waste. Disinfection of water reservoirs and sewage management further enhance public health.

Q. 2. In which way has the study of biology helped us to control infectious diseases?

ANSWER:-

Biology is an extensive branch of science that focuses on life forms and their processes. It has contributed significantly to the control of infectious diseases in the following ways:

- The complete eradication of deadly diseases like smallpox was achieved through immunization programs and vaccines.
- Vaccines have also been effective in controlling other infectious diseases, including diphtheria, polio, and pneumonia.
- The successful treatment of numerous infectious diseases has been made possible using antibiotics and other medications.



Q. 3. How does the transmission of each of the following diseases take place?

- (a) Amoebiasis
- (b) Malaria
- (c) Ascariasis
- (d) Pneumonia

ANSWER:-

- **Amoebiasis:** Ingestion of Quadri-nucleated cysts of *Entamoeba histolytica* can result in the cysts being passed from the patient's faeces through contaminated water and food.
- **Malaria:** The malarial parasite, *Plasmodium*, is transmitted to a healthy person when bitten by an infected female *Anopheles* mosquito.
- **Ascariasis:** This can be contracted by ingesting food or water contaminated with the embryonated eggs of *Ascaris*.
- **Pneumonia:** It is transmitted through droplets and sputum released when the patient coughs. Pneumonia is a bacterial infection.

Q.4. What measure would you take to prevent water-borne diseases?

ANSWER:-

Measures to prevent water-borne diseases include:

- Ensuring access to clean drinking water
- Prohibiting industries from discharging waste into water sources
- Regular cleaning and disinfection of water tanks and reservoirs

Q. 5. Discuss with your teacher what does 'a suitable gene' means, in the context of DNA vaccines.

ANSWER:-

The term 'suitable gene' refers to a specific segment of DNA that can be modified in the host to produce a protein designed to target and eliminate a particular disease-causing organism.

Q. 6. Name the primary and secondary lymphoid organs.

ANSWER:-

Primary lymphoid organs include the thymus and bone marrow.

Secondary lymphoid organs consist of mucosal-associated lymphoid tissues (MALT), lymph nodes, spleen, and Peyer's patches (in the small intestine).

Q. 7. The following are some well-known abbreviations, which have been used in this chapter. Expand each one to its full form:

- (a) MALT
- (b) CMI



- (c) AIDS
- (d) NACO
- (e) HIV

ANSWER:-

- (a) Mucosal-Associated lymphoid tissues
- (b) Cell-mediated Immunity
- (c) Acquired Immuno-Deficiency Syndrome
- (d) National AIDS Control Organization
- (e) Human Immuno-deficiency Virus

Q. 8. Differentiate the following and give examples of each:

- (a) Innate and acquired immunity
- (b) Active and passive immunity

ANSWER:-

(a) Innate and acquired immunity

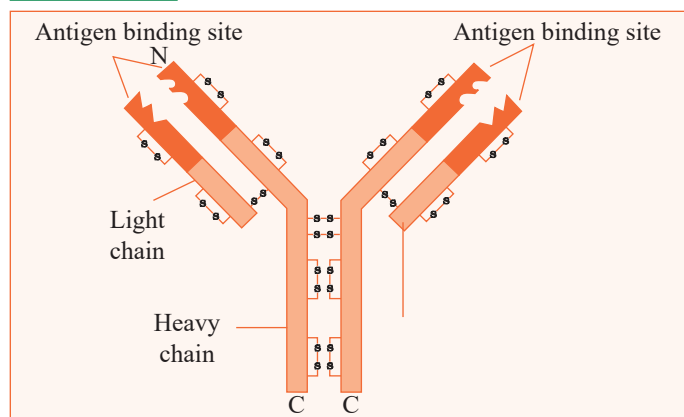
Innate Immunity	Acquired Immunity
Non-specific defence	Specific defence
Present at birth	Develops in response to a specific pathogen
Involves various barriers	Has memory of antibodies
Example: Mucus traps bacteria and particles	Example: Post-vaccination antibodies respond

(b) Active and passive immunity

Active Immunity	Passive Immunity
The body produces antibodies in response to pathogens	Antibodies are introduced into the body through injection
Slower immune response	Faster immune response
Example: Antibodies produced after vaccination	Example: Colostrum contains antibodies

Q. 9. Draw a well-labelled diagram of an antibody molecule.

ANSWER:-



Q. 10. What are the various routes by which transmission of human immune-deficiency virus takes place?

ANSWER:-

The human immunodeficiency virus (HIV) can be transmitted through the following routes:

- Sexual contact with an infected individual
- Organ transplantation from an infected donor
- Transfusion of contaminated blood or blood products
- Transmission from mother to child via the placenta

Q. 11. What is the mechanism by which the AIDS virus causes deficiency of immune system of the infected person?

ANSWER:-

- Once the virus enters the body, it infects macrophages, where its RNA genome is converted into viral DNA by the reverse transcriptase enzyme.
- This viral DNA is integrated into the host cell's DNA, prompting the infected cells to produce viral particles.
- The macrophages act as factories, continuously producing the virus. Simultaneously, HIV infects helper T-lymphocytes, replicating within them and releasing new virus particles into the bloodstream.
- These particles then target other helper T-lymphocytes, leading to a progressive decrease in their count.
- Over time, this depletion of helper T-lymphocytes weakens the body's immune defence, a condition known as acquired immunodeficiency.

Q. 12. How is a cancerous cell different from a normal cell?

ANSWER:-

Cancerous Cell	Normal Cell
These cells lack contact inhibition, causing them to keep dividing and forming clusters	These cells exhibit contact inhibition, stopping division when they make contact with other cells
Do not undergo differentiation	Undergo differentiation once they reach maturity
Cells are not restricted and spread to nearby tissues, disrupting their function	Cells remain confined to a specific area

Q. 13. Explain what is meant by metastasis.

ANSWER:-

Metastasis is a pathological process seen in malignant tumours, where cancerous cells spread to various parts of the body. These cells continue to divide without limit, forming new clusters known

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as tumours. Some of the cells from the original tumour break off and enter the bloodstream, traveling to distant areas of the body where they initiate the formation of new tumours by actively dividing.

Q. 14. List the harmful effects caused by alcohol/drug abuse.

ANSWER:-

The harmful effects of alcohol and drug abuse are as follows:

Harmful effects of alcohol:

- **On the individual:** Excessive alcohol consumption damages vital organs such as the nervous system and liver. This can lead to symptoms like fatigue, depression, weight loss, aggression, and loss of appetite. In extreme cases, it may result in heart failure, coma, or death.
- **On the family:** Alcohol abuse by a family member can cause domestic violence, verbal abuse, irritability, and insecurity, negatively affecting family relationships.
- **On society:** Alcohol abuse leads to impulsive behavior, social isolation, violence, and a lack of interest in social activities.

Harmful effects of drugs:

- **On the individual:** Drug abuse severely impacts the central nervous system and can cause dysfunction in various organs, including the liver and kidneys. Additionally, drug users are at risk of contracting HIV due to the sharing of needles. Drug addicts may experience both short-term and long-term effects, such as mood swings, aggression, and depression.
- **On the family and society:** A drug addict creates significant disruptions within both the family and society. Dependence on drugs leads to frustration, irritability, and anti-social behaviour.

Q. 15. Do you think that friends can influence one to take alcohol/drugs? If yes, how may one protect himself/herself from such an influence?

ANSWER:-

Yes, friends can influence each other to start using drugs and consuming alcohol. The following precautionary measures can help protect oneself from alcohol or drug abuse:

- Maintain strong willpower and avoid experimenting with alcohol out of curiosity, for fun, or peer pressure.
- Stay away from individuals who use drugs.
- Seek guidance from elders, peers, or medical professionals.
- Educate yourself about the harmful consequences of drug abuse.
- Consider attending counselling sessions.
- Engage in hobbies or extracurricular activities.
- If feelings of depression or frustration persist or worsen, seek immediate medical or professional help.



Q. 16. Why is that once a person starts taking alcohol or drugs, it is difficult to get rid of this habit? Discuss it with your teacher.

ANSWER:-

Alcohol consumption and drug use have a strong, addictive effect associated with euphoria, providing a temporary sense of well-being. Frequent use of drugs can raise the body's receptor tolerance, which in turn leads to an increased need for more drug consumption.

Q. 17. In your view what motivates youngsters to take to alcohol or drugs and how can this be avoided?

ANSWER:-

Various factors drive young people towards drug and alcohol use:

- Initial reasons often include curiosity, excitement, a sense of adventure, and experimentation.
- Some individuals turn to these substances to cope with negative emotions like pressure, depression, stress, or frustration, believing it may help them perform better in other areas.
- Media outlets, such as the internet, television, newspapers, and movies, can also influence youth by promoting alcohol use.
- Additional factors include an unsupportive family environment, unstable relationships, and peer pressure.

