CBSE NCERT Solutions for Class 12 Science Chapter 8

Back of Chapter Questions

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

Various public health measures to safeguard infections are:

- Maintainance of public and personal hygiene
- Practising immunisation.
- Eradication of certain deadly diseases such as smallpox.
- Creating awareness about the various vaccines.

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

Solution:

Biology has given us a lot of information such as awareness about the preventive measures for a disease. A lot of vaccines have been developed by understanding the method of infection by the micro-organism. People are immunised against several deadly diseases such as smallpox. In case the disease occurs, antibiotics help in keeping the spread of infection in control.

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

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

Solution:

(a) Amoebiasis: Ingestion of quadrinucleate cysts of *Entamoeba histolytica* found in contaminated food and water results in amoebiasis. The cysts are found in faeces of patients, which enters food and water.

(b) Malaria: It is a vector-borne disease where *Plasmodium* (a malarial parasite) is carried by female Anopheles mosquito and transmit the disease from patient to a healthy person when a mosquito bites the latter.

(c) Ascariasis: Ingestion of contaminated food and water infected with embryonated eggs of Ascaris worms.

(d) Pneumonia: It is an airborne disease transmitted by the sputum and droplets released when a patient coughs.
4. What measures would you take to prevent water-borne diseases?

**Solution:**

Waterborne diseases can be prevented by following methods:-

- Consumption of pure drinking water.
- Periodic disinfection of waterborne diseases.
- Maintaining personal and public hygiene.

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

**Solution:**

Suitable gene is the segment of DNA which is inserted into the host. This DNA forms the infection-causing proteins of the micro-organism. The antibodies are generated by our body against these proteins hence giving us immunity for a future encounter with the disease-causing microorganism.

6. Name the primary and secondary lymphoid organs.

**Solution:**

Primary lymphoid organs are:

- Bone marrow
- Thymus

The secondary lymphoid organ includes:

- Spleen
- Tonsils
- Peyer’s patches
- Lymph Nodes
- Vermiform appendix
- Mucosa-associated lymphoid tissue (MALT)

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

**Solution:**

(a) MALT - Mucosa associated lymphoid tissue
(b) CMI - Cell-mediated immunity
(c) AIDS - Acquired immunodeficiency syndrome
(d) NACO - National AIDS control organisation
(e) HIV - Human immunodeficiency virus

8. Differentiate the following and give examples of each:

(a) Innate and acquired immunity

**Solution:**

<table>
<thead>
<tr>
<th>Innate Immunity</th>
<th>Acquired Immunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Innate Immunity is the immunity which is present by birth.</td>
<td>Acquired immunity is the immunity which is achieved by actively fighting against the diseases.</td>
</tr>
<tr>
<td>Innate immunity consists of the chemical and physiological barrier.</td>
<td>Acquired immunity is because of B cells and T cells</td>
</tr>
<tr>
<td>It is nonspecific</td>
<td>It is specific.</td>
</tr>
<tr>
<td>Immunological memory is there</td>
<td>Immunological memory is present</td>
</tr>
<tr>
<td>Example: Skin acts as a barrier.</td>
<td>Example: Antibody response after vaccination.</td>
</tr>
</tbody>
</table>

(b) Active and passive immunity

<table>
<thead>
<tr>
<th>Active Immunity</th>
<th>Passive Immunity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active immunity is the immunity which is achieved when the body fights actively against infection and produce its own antibodies.</td>
<td>Passive immunity is the immunity which is achieved when the antibody is provided from outside.</td>
</tr>
<tr>
<td>It is long lasting and slow.</td>
<td>It is rapid but does not last for a longer duration</td>
</tr>
<tr>
<td>Example - When the body produces an antibody against dead micro-organism in vaccines.</td>
<td>When antibodies are provided to the baby through mothers milk.</td>
</tr>
</tbody>
</table>
9. Draw a well-labeled diagram of an antibody molecule.

Solution:

10. What are the various routes by which transmission of human immunodeficiency virus takes place?

Solution:

The routes by which transmission of HIV takes place is:

- Sexual contact with an infected person
- Use of contaminated needles for drug abuse.
- Transfusion of infected blood.
- Infected mother to fetus.

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

Solution:

- HIV enters the body through macrophage.
- The viral RNA genome forms viral DNA using reverse transcriptase
- Viral DNA enters the host cell to produce viral particles and turns the macrophage into the viral factory.
- After infecting macrophages, the virus infects T helper lymphocytes and produce more virus particles.
- T helper lymphocytes start decreasing in number.
12. How is a cancerous cell different from a normal cell?

**Solution:**

A cancerous cell does not have the property of contact inhibition, and hence, they divide uncontrollably causing tumours.

- Cancer cells differentiate, whereas normal cell does not undergo differentiation.
- Cancer cells can undergo metastasis while this property is absent in normal cells.

13. Explain what is meant by metastasis.

**Solution:**

Metastasis is the property of tumour cells to lodge in various parts of the body and cause another set of tumour cells. It is the transfer of malignant tumour from a primary to the secondary region of a body through lymph or blood. The cancerous cells migrate through blood or lymph to other regions of the body after getting released from the malignant tumour, which accumulates to form secondary tumour growth. The migration and settling of malignant tumour breaks are called metastasis.

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

**Solution:**

Harmful effects of drug abuse are:

- Recklessness, vandalism, abnormal social behaviour
- Mental depreciation and disorders in psychological behaviour.
- Excessive abuse of alcohol leads to coma and death.
- Respiratory failure, heart failure, and cerebral hemisphere.
- Financial distress and mental stress.
- Serious disease such as AIDS, hepatitis B.
- Nervous damage and liver cirrhosis.
- Masculation in females and female characters in males due to anabolic steroids.
- Stunted growth

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?
Solution:

Yes, friends can influence one in taking alcohol/drugs. Following measures can be taken:

(i) Avoid undue peer pressure.
(ii) Get counseling from a counselor.
(iii) Practice good habits.
(iv) Seek medical help.

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.

Solution:

Upon taking alcohol or drugs the person feels either energetic or calm. This happens due to the sudden increase in neurotransmitters. When these drugs are withdrawn the person feels uneasiness hence feel like consuming it again, making it difficult to quit. This tendency of the body to manifest a characteristic and unpleasant feeling is referred to as withdrawal syndrome.

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

Solution:

Youngsters are in a very vulnerable state of mental and psychological development, the reasons the fall in prey of drug and alcohol abuse are:

Curiosity to experiment which later becomes an escape to facing the problem.

There is a perception that teenagers feel very progressive if they consume alcohol or smoke.

Consumption of drug is common in order to cope up with exam pressure.

Television, movies, newspaper promotes the perception that consumption of alcohol is part of a good lifestyle.

Use of the drug is also common in the cases where it is unsupportive and unstable family structure and family pressure.

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