Question 1:

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 hygienic 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 immunizationto 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 *Gambusia* in ponds also controls the breeding of mosquito larvae in stagnant water.

Question 2:

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 small pox, 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.

Question 3:

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

(a) Amoebiasis

(b) Malaria

(c) Ascariasis

(d) Pneumonia

Answer

	Disease	**Causative organism**	**Mode of transmission**
a.	*Amoebiasis*	*Entamoeba histolytica*	It is a vector-borne disease that spreads by the means of contaminated food and water. The vector involved in the transmission of this disease is the housefly.
b.	Malaria	*Plasmodium sp.*	It is a vector-borne disease that spreads by the biting of the female *Anopheles* mosquito.

c.	Ascariasis	*Ascaris lumbricoides*	It spreads via contaminated food and water.
d.	Pneumonia	*Streptococcus pneumoniae*	It spreads by the sputum of an infected person.

Question 4:

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

Answer

Water-borne diseases such as cholera, typhoid, hepatitis B, etc. spread by drinking contaminated water. These water-borne diseases can be prevented by ensuring proper disposal of sewage, excreta, periodic cleaning. Also, measures such as disinfecting community water reservoirs, boiling drinking water, etc. should be observed.

Question 5:

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

Answer

A 'suitable gene' refers to a specific DNA segment which can be injected into the cells of the host body to produce specific proteins. This protein kills the specific disease-causing organism in the host body and provides immunity.

Question 6:

Name the primary and secondary lymphoid organs.

Answer

(a) Primary lymphoid organs include the bone marrow and the thymus.

(b) Secondary lymphoid organs are the spleen, lymph nodes, tonsils, Peyer's patches of small intestine, and appendix.

Question 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) MALT- Mucosa-Associated Lymphoid Tissue

(b) CMI- Cell-Mediated Immunity

(c) AIDS- Acquired Immuno Deficiency Syndrome

(d) NACO- National AIDS Control Organization

(e) HIV- Human Immuno Deficiency virus

Question 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**
1.	It is a non–pathogen specific type of defense mechanism.	**1.**	It is a pathogen specific type of defense mechanism.
2.	It is inherited from parents and protects the individual since birth.	**2.**	It is acquired after the birth of an individual.

3.	It operates by providing barriers against the entry of foreign infectious agents.	**3.**	It operates by producing primary and secondary responses, which are mediated by B–lymphocytes and T-lymphocytes.
4	It does not have a specific memory.	**4**	It is characterized by an immunological memory.

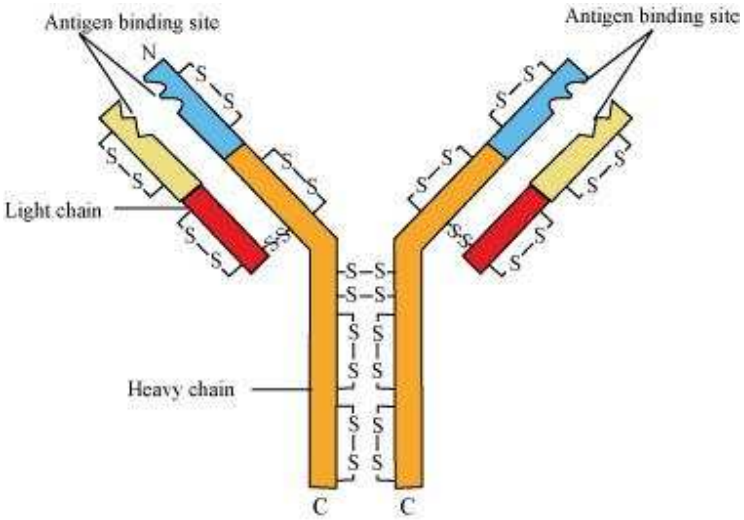
(b) Active and passive immunity

	Active immunity		**Passive immunity**
1.	It is a type of acquired immunity in which the body produces its own antibodies against disease-causing antigens.	**1.**	It is a type of acquired immunity in which readymade antibodies are transferred from one individual to another.
2.	It has a long lasting effect.	**2.**	It does not have long lasting effect.
3.	It is slow. It takes time in producing antibodies and giving responses.	**3.**	It is fast. It provides immediate relief.
4.	Injecting microbes through vaccination inside the body is an example of active immunity.	**4.**	Transfer of antibodies present in the mother's milk to the infant is an example of passive immunity.

Question 9:

Draw a well-labelled diagram of an antibody molecule.

Answer



Structure of an antibody molecule

Question 10:

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

Answer

AIDS (Acquired Immuno Deficiency Syndrome) is caused by the Human immunodeficiency virus (HIV).

It has the following modes of transmission:

(a) Unprotected sexual contact with an infected person.

(b) Transfusion of blood from a healthy to an infected person.

(c) Sharing infected needles and syringes.

(d) From an infected mother to a child through the placenta.

Question 11:

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

Answer

AIDS (Acquired Immuno Deficiency Syndrome) is caused by the Human immunodeficiency virus (HIV) via sexual or blood-blood contact. After entering the human body, the HIV virus attacks and enters the macrophages. Inside the macrophages, the RNA of the virus replicates with the help of enzyme reverse transcriptase and gives rise to viral DNA. Then, this viral DNA incorporates into the host DNA and directs the synthesis of virus particles. At the same time, HIV enters helper T- lymphocytes. It replicates and produces viral progeny there. These newly formed progeny viruses get released into the blood, attacking other healthy helper T-lymphocytes in the body. As a result, the number of T-lymphocytes in the body of an infected person decreases progressively, thereby decreasing the immunity of a person.

Question 12:

How is a cancerous cell different from a normal cell?

Answer

	Normal cell		**Cancerous cell**
1.	Normal cells show the property of contact inhibition. Therefore, when these cells come into contact with other cells, they stop dividing.	**1**	Cancerous cells lack the property of contact inhibition. Therefore, they continue to divide, thereby forming a mass of cells or tumor.
2.	They undergo differentiation after attaining a specific growth.	**2.**	They do not undergo differentiation.
3.	These cells remain confined at a particular location.	**3**	These cells do not remain confined at a particular location. They move into neighboring tissues and disturb its function.

Question 13:

Explain what is meant by metastasis.

Answer

The property of metastasis is exhibited by malignant tumors. It is the pathological process of spreading cancerous cells to the different parts of the body. These cells divide uncontrollably, forming a mass of cells called tumor. From the tumor, some cells get sloughed off and enter into the blood stream. From the blood stream, these cells reach distant parts of the body and therefore, initiate the formation of new tumors by dividing actively.

Question 14:

List the harmful effects caused by alcohol/drug abuse.

Answer

Alcohol and drugs have several adverse effects on the individual, his family, and the society.

A. Effects of alcohol:

Effects on the individual: Alcohol has an adverse effect on the body of an individual. When an individual consumes excess alcohol, it causes damage to the liver and the nervous system. As a result, other symptoms such as depression**,** fatigue, aggression, loss of weight and appetite may also be observed in the individual. Sometimes, extreme levels of alcohol consumption may also lead to heart failure, resulting coma and death. Also, it is advisable for pregnant women to avoid alcohol as it may inhibit normal growth of the baby.

Effects on the family: Consumption of excess alcohol by any family member can have devastating effects on the family. It leads to several domestic problems such as quarrels, frustrations, insecurity, etc.

Effects on the society:

(a) Rash behavior

(b) Malicious mischief and violence

(c) Deteriorating social network

(d) Loss of interest in social and other activities

B Effects of drugs: An individual who is addicted to drugs creates problems not only for himself but also for his family.

Effects on the individual: Drugs have an adverse effect on the central nervous system of an individual. This leads to the malfunctioning of several other organs of the body such as the kidney, liver, etc. The spread of HIV is most common in these individuals as they share common needles while injecting drugs in their body. Drugs have long-term side effects on both males and females. These side effects include increased aggressiveness, mood swings, and depression

Effects on the family and society: A person addicted to drugs creates problems for his family and society. A person dependant on drugs becomes frustrated, irritated, and anti-social.

Question 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 one to take drugs and alcohol. A person can take the following steps for protecting himself/herself against drug abuse:

(a) Increase your will power to stay away from alcohol and drugs. One should not experiment with alcohol for curiosity and fun.

(b) Avoid the company of friends who take drugs.

(c) Seek help from parents and peers.

(d) Take proper knowledge and counseling about drug abuse. Devote your energy in other extra-curricular activities.

(e) Seek immediate professional and medical help from psychologists and psychiatrists if symptoms of depression and frustration become apparent.

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Question 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

Drug and alcohol consumption has an inherent addictive nature associated with euphoria and a temporary feeling of well-being. Repeated intake of drugs increases the tolerance level of the body's receptors, leading to more consumption of drugs.

Question 17:

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

Answer

Many factors are responsible for motivating youngsters towards alcohol or drugs. Curiosity, need for adventure and excitement, experimentation are the initial causes of motivation. Some youngsters start consuming drugs and alcohol in order to overcome negative emotions (such as stress, pressure, depression, frustration) and to excel in various fields. Several mediums like television, internet, newspaper, movies etc. are also responsible for promoting the idea of alcohol to the younger generation. Amongst these factors, reasons such as unstable and unsupportive family structures and peer pressure can also lead an individual to be dependant on drugs and alcohol.

Preventive measures against addiction of alcohol and drugs:

(a) Parents should motivate and try to increase the will power of their child.

(b) Parents should educate their children about the ill-effects of alcohol. They should provide them with proper knowledge and counselling regarding the consequences of addiction to alcohol.

(c) It is the responsibility of the parent to discourage a child from experimenting with alcohol. Youngsters should be kept away from the company of friends who consume drugs.

(d) Children should be encouraged to devote their energy in other extra- curricular and recreational activities.

(e) Proper professional and medical help should be provided to a child if sudden symptoms of depression and frustration are observed.

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CHAPTER 8

HUMAN HEALTH AND DISEASE

POINTS TO REMEMBER

Carcinogens : Cancer causing agents. e.g., gamma rays. UV rays, dyes and lead.

Immuno Suppressant : The chemical which supress the immunity response to antigen partially or completely.

Interferon : The glycoproteins produced by our body cells in response to a viral infection.

Incubation Period : The time period between infection and the appearance of symptoms.

Metastasis : The property in which the cancer cells spread to different sites through blood and develop secondary tumors.

Oncogenes : Viral genome which causes cancer.

Retrovirus : A virus having RNA as genetic material and forms DNA by reverse transcription and then replicate e.g., Human Immunodeficiency Virus (HIV).

Sporozoites : The infective stage of protozoa Plasmodium which is injected into human blood through saliva of female Anopheles mosquito.

Syndrome : Collection of disease symptoms responsible for a disorder or a disease.

Vaccination : Inoculation of a vaccine to stimulate production of antibodies and provide immunity for one or more disease.

ABBREVIATIONS

PMNL : Polymorpho-Nuclear Leukocytes

CMI : Cell Mediated Immunit

ELISA : Enzyme Linked Immunosorbent Assay

HLA : Human Leukocyte Antigen

MALT : Mucosal Associated Lymphoid Tissue

SCID : Severe Combined Immuno Deficiency

NACO : National AIDS Control Organisation

MRI : Magnetic Resonance Imaging

- **Health -** The state of complete physical, mental and social well beings
- Good health can be achieved by
  - (i) awareness about disease and their effects on different body functions.
  - (ii) vaccination
  - (iii) control of vectors
  - (iv) proper disposal of wastes
  - (v) Maintenance of hygienic food and water resources.
- **Infectious Diseases**
  - (i) Viral Diseases eg. polio, common cold, measles, rabies
  - (ii) Bacterial diseases. eg. Typhoid, pneumonia, Diptheria, Tetanus,
  - (iii) Fungal diseases - eg. Ring worm & Scabies (v) Helminthic diseases-eg Ascariasis, Filariasis, Taeniasis

Disease	Causative Agents	Symptoms
1. Common cold	Rhinoviruses	Nasal congestion and discharge, sore throat cough, headache, tiredness and hoarseness.
2. Typhoid	*Salmonella typhi*	sustained high fever, stomach pain, loss of appetite, constipation, headache.
3. Pneumonia	*Streptococcus pneumoniae* and *Haemophilus influenzae*	fever, headache, cough, chills. in severe cases finger nails may turn grey to bluish in colour.
4. Malaria	*Plasmodium P. malaria,*	yaming, tiredness, acute headache, muscular pain,

	P.vivax, P. falciparum	feeling of chillness and shivering, nausea and high temperatures
5. Amoebic dysentry	*Entamoeba histolytica*	Abdominal pain, cramps, stool with excess mucus and blood clots,constipation
6. Ringworm	*Microsporum Epidermophyton and Trichophyton*	Dry scaly lesions on skin, nails and scalp, itching
7. Ascariasis	*Ascaris lumbricoides*	Anaemia, muscular pain, internal bleeding, insomnia, blockage of intestinal passage
8. Filariasis or Elephantiasis	*Wuchereria bancrofti and W. malayi*	fever, blockage of lymphatic vessels, enormous swelling of affected part viz. arm, foot, leg, mamma or scrotum

Immunity : Resistance to infections or antigens.

Two types of immunities .

(i) Innate immunity : inherited by the organism from the parents and protects from birth through out life.

Four types of barriers

(a) Physical - eg skin, mucus coating epithelium of respiratory, gastrointestinal and urinogenital tracts.

(b) Physiological - eg. acid of stomach, lysozymes of saliva and tears

(c) Cellular eg. PMNL, monocytes, Neutrophils and macrophages

(d) Cytokine - eg virus infected cells secrete proteins called interferons which protect non-infected cells from further infection

(ii) Acquired Immunity . Acquired by a person after birth by vaccination or contacting the disease.

FACTORS AFFECTING HEALTH

(a) Genetic : Child may inherit certain disorders from parents.

(b) Life Style : Water/food intake, rest, exercise, personal hygiene.

(c) Infection and Corresponding immunity.

Acquired Specific Immunity
(Defense Mechanism)

Antibody Mediated Immune System	Cell Mediated Immune System
Antibodies circulating in blood and lymph defend against virus and bacteria that enter blood.	B-Cells T-cells protect against pathogens that invade the host tissue.

- It is based on the principle of memory and immunity.
- The antigenic preparations of proteins of pathogens or a solution of inactivated or weakened pathogens are introduced in the body.
- The antigenic properties are recognised.
- Cascade of reactions forms antibodies.
- History of reactions is stored as memory.
- Subsequent exposures result in intensified response.

Allergens —attach→ B-cells —Produce→ Plasma cells —Produce→ Antibodies (Ig E)

Antibodies (Ig E) —attach→ Mast cells (with allergen and antibody)

Mast cells —on second exposure→ Histamine & Serotonin —→ Inflammatory response (allergy

Drugs

Criteria	**Opiods**	**Cannabinoids**	**Coca alkaloids**
Source	Papaver sominiferum (Popply Plant)	Cannabis sativa (Hemp Plant)	Erythroxylum coca (Coca plant)
Part of Plant	Fruits (Unripen Capsules)	Inflorescence, resin leaves,	Leaves and Young twigs
Product	Opium, Morphine Heroin/Smack	Charas, Ganja Hashish Marijuana	Cocaine (Coke/ Crack)
Mode of Intake	Snorting, Injection	Oral, Inhalation	Snorting
Effects	Neuro depressant, (Property) Slow down the functions of the body	Interact with cannabinoid receptors, Cardiovascular system effects	Sense of euphoria interferes with neur-otransmitters, Hallucination

– **Acquired Immunity**

(i) May be Humoral (containing antibodies which circulate in body fluids). mediated by B.lymphocytes.

(ii) Cell-Mediated (CMI) - mediated by T-lymphocytes

– Acquired immunity may be active or passive.

– Vaccination and immunisation are based on the property called 'memory' of the immune systems.

– **Symptoms of Allergy–** Sneezing, watery eyes, rashes, running nose and difficulty in breathing.

– **Auto Immunity** - When the immune system of body starts distroying 'self' cells and molecules, called auto immune diseases eg Rheumatoid arthritis, multiple sclerosis and insulin-dependent diabetes.

– Immune system in the body play an important role in organ transplantation, allergic reactions and auto immune diseases

– Immune system consists of lymphoid organs, bone marrow, thymus, spleen,lymph nodes and MALT (Mucosal Associated Lymphoid Tissue)

AIDS - (Acquired Immuno Dificiency Syndrome)

– caused by HIV (Human Immunodeficiency Virus) which belongs to retrovirus category of viruses.

Modes of transmission

– By sexual contact with infected person

– By transfusion of contaminated blood and blood products

– By sharing the infacted needles

– From infected mother to child through placenta

Persons who are at high risk of getting infection include-

– Individuals who have multiple sex partners.

– Drug addicts taking drugs intravenously- Individuals who require repeated blood transfusions

- Children born to HIV infected mother

Prevention of AIDS

- Using disposal syringes and needles, checking the blood of HIV, controlling drug abuse, free distribution of condoms and advocating safe sex.

- Main test for AIDS in ELISA (Enzyme Linked Immuno Sorbant Assay)

Cancer

- Carcinogens induce the transformation of normal cells into cancerous cells eg. UV rays, X-rays, g-rays, anilene dyes and tumour viruses, cadmium oxide, mustard gas, Ni & Cr compounds etc

Two types of tumors . (a) Benign - confined to the area of formation and do not spread to other parts. (b) Malignant - show metastasis ie. cells of these tumors can be carried by blood stream or lymph to other parts of body and form secondaries in neighbouring organs.

Treatment - through surgery, radiotherapy, chemotherapy, immunotherapy.

QUESTIONS

VSA (1 MARK)

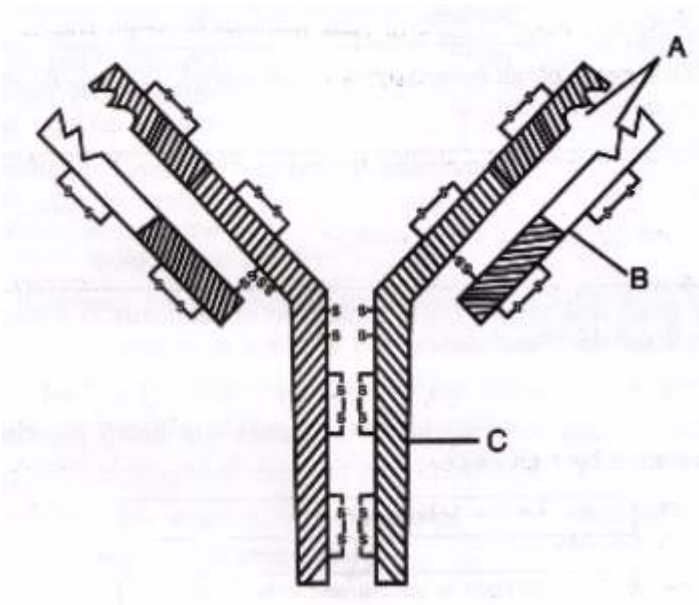
1. Name the diagnostic test which confirms typhoid.
2. Name the two major groups of cells required to attain specific immunity.
3. You have heard of many incidences of Chickengunya in our country. Name the vector of the disease.
4. Breast fed babies are more immune to diseases than the bottle fed babies. Why?
5. Name the pathogen which causes malignant malaria.
6. Which microorganism is used to produce hepatitis B Vaccine?
7. What is the reason of shivering in malarial patient?

SA-II (2 MARKS)

8. Where are B-cells and T-cells formed? How do they differ from each other?
9. Given below are the pathogens and the diseases caused by them. Which out of these pairs is not correct matching pair and why?
   (a) *Wuchereria* - Filariasis
   (b) *Microsporum* - Ringworm
   (c) *Salmonella* - Common Cold
   (d) *Plasmodium* - Malaria
10. What would happen to the immune system, if thymus gland is removed from the body of a person?
11. Lymph nodes are secondary lymphoid organs. Describe the role of lymph nodes in our immune response.
12. What is the role of histamine in inflammatory response? Name few drugs which reduce the symptoms of allergy.

SA-I (3 MARKS)

13. What are Cannabinoids? From which plant Cannabinoids are obtained? Which part of the body is affected by consuming these substances?
14. In the figure, structure of an antibody molecule is shown. Observe it and Give the answer of the following questions.
    (i) Label the parts A, B and C.
    (ii) Which cells produce these chemicals?
    (iii) State the function of these molecules.



15. Mention any three causes of drug abuse. Suggest some measures for the prevention and control of drug abuse.
16. A person shows unwelcome immunogenic reactions while exposed to certain substances.
    (a) Name this condition.
    (b) What common term is given to the substances responsible for this condition?
    (c) Name the cells and the chemical substances released which cause such reactions.

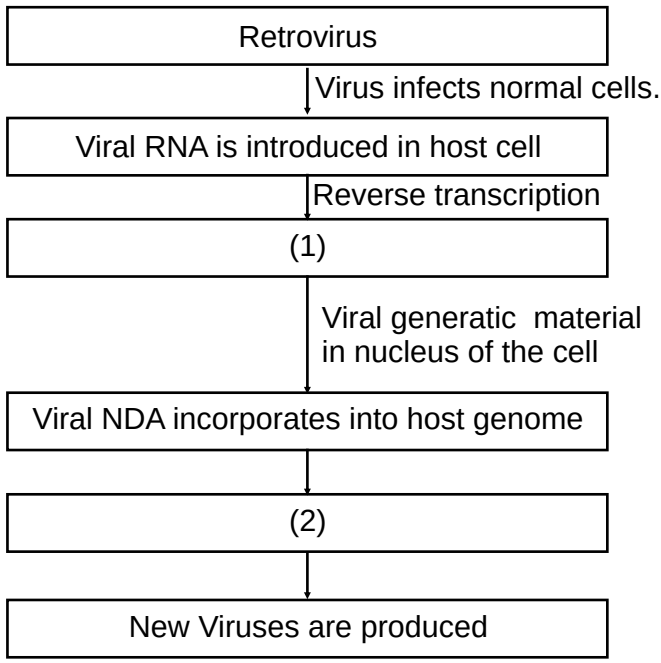
17. Fill in the blanks in the different columns of the table given below to identify the nos 1 to 6.

	Name of disease	***Causative organism***	***Symptoms***
1.	Pneumonia	*Streptococcus*	(1)
2.	Typhoid	(2)	High fever, weakness, headache, stomach pain
3.	(3)	Rhinoviruses	Nasal Congestion, and discharge sorethroat cough, headache
4.	Ascariasis	*Ascaris*	(4)
5.	Ringworm	(5)	Dry, Scaly lesions on various body parts, Intense itching, redness.
6.	(6)	*Entamoeba histolytica*	Constipation, cramps, abdominal pain, Stools with excess mucous and blood clots.

18. In the given flow diagram, the replication of retrovirus in a host cell is shown. Examine it and answer the following questions

(a) Why is virus called reterovirus? (b) Fill in (1) and (2)

(c) Can infected cell survie while viruses are being replicated and released by host cell?



19. What is innate immunity? List the four types of barriers which protect the body from the entry of the foreign agents.

LA (5 MARKS)

20. Answer the following with respect to Caner.
    (a) How does a cancerous cell differ from a normal cell?
    (b) Benign tumor is less dangerous than malignant tumor. Why
    (c) Describe causes of cancer.
    (d) mention two methods of treatment of the disease.
21. The pathogen of a disease depends on RBCs of human for grwoth and reproduction. The person with this pathogen suffers with chill and high fever.
    (a) Identify the disease.
    (b) Name the pathogen.
    (c) What is the cause of fever?
    (d) Represent the life cycle of the pathogen diagrammatically.
22. The immune system of a person is supressed. He was found positive for a pathogen in the diagnostic test ELISA.
    (a) Name the disease, the patient is suffering from.
    (b) Which pathogen is identified by ELISA test?
    (c) Which cells of the body are attacked by the pathogen?
    (d) Suggest preventive measure of the infection.

ANSWERS

VSA (1 MARK)

1. Widal test
2. B-lymphocytes and T-lymphocytes.
3. *Aedes* mosquitoes.
4. The mother.s milk consists of antibodies (Ig A) such antibodies are not available to bottle fed babies.
5. *Plasmodium falciparum.*
6. Yeast.
7. After sparozoite infection, when RBC ruptures, a toxic substance haemozoin is released which cause chilling and high fever.

SA-II (2 MARKS)

8. B-cells and T-cells are formed in bone marrow. B-cells produce antibodies but E-cells do not produce antibodies but help B-cells to produce them.
9. *Salmonella :* Common cold is not a matching pair.
10. T-lymphocytes are developed and matured in thymus gland, Immune system will become weak on removal of thymus gland.
11. Lymph nodes provide the sites for interaction of lymphocytes with the antigen. When the microorganisms enter the lymph nodes, lymphocytes present there are activated and cause the immune response.
12. Histamine acts as allergy-mediator which cause blood vessels to dilate. It is released by mast cells. Antihistamine steroids and adrenaline quickly reduce the symptoms of allergy.

SA-I (3 MARKS)

13. – Cannabinoids are a group of chemicals which interact with Cannabinoid receptors present
    – Principally in the brain Cannabinoids are obtained from the inflorescences of the plant Cannabis sativa.
    – The substances affect the cardiovascular system adversely
14. (a) A-Antigen binding site B-Light chain
    (b) B-lymphocytes.
    (c) Heavy Chain
    (d) Antibodies provide acquired immune response.
15. **Reasons to attract towards drug abuse :** Curiosity, peer pressure, escape from frustation and failure, family problems, false belief of enhanced performance.

    Preventive measures :

    – Avoid undue peer pressure
    – Education and Counselling
    – Seeking help from parents and peers.
    – Looking for danger signs
    – Seeking professional and medical help

16. (a) Allergy (b) Allergens

(c) Mast Cells . Histamine, Serotonin

17. (i) Alveoli filled with fluid, reduced breathing, fever, chills, cough and headache.

(ii) *Salmonella typhi*

(iii) Common Cold

(iv) Internal bleeding, muscular pain, anaemia, fever and blockage of the intestinal passage.

(v) *Microsporum* species/*Trichophyton* species/*Epidermophyton* Species.

(vi) Amoebiasis/amoebic dysentery

18. (a) HIV has RNA genome. It produces DNA by reverse transcription.

(b) 1 : Viral DNA is produced by reverse transcriptase.

2 : New Viral RNA is produced by the infected cell.

(c) Infected cell can survive.

19. Innate Immunity is non-specific type of defense that is present at the time of birth.

(i) **Physical Barriers :** Skin, mucous-coated epithelium or respiratory, digestive and urinogenital tract.

(ii) **Physiological Barriers :** Acidity of Stomach, lysozyme in saliva, tears, sweat.

(iii) **Cellular Barrier :** Macrophages, neutorophils, monocytes and natural killer lymphocytes..

(iv) **Cytokine Barriers :** Interferons produced by Viral infected cells, protect the non-infected cells from further Viral infection.

20. (a) In normal cells, growth and differentiation is highly controlled and regulated (contact inhibition). The cancerous cells have lost the property of contact inhibition, hence continue to divide giving rise to masses of cells (tumors).

(b) The benign tumor remains confined in the organ affected as it is enclosed in a connective tissue sheath and does not enter the metastatic stage.

(c) Cancer may be caused due to carcinogens which are physical (radiations), chemicals (Nicotine, Aflatoxin, Cadmium oxide, Asbestos) and biological (viral oncogens).

(d) Surgery, radiotherapy, Chemotherapy

21. (a) Malaria

(b) Different species of Plasmodium viz P. vivax, P. Malariae and P. falciparum.

(c) Malaria is caused by the toxins (haemozoin) produced in the human body by the malarial parasite. This toxin is released by the rupturing of RBCs.

(d) Life cycle of *Plasmodium* : Fig. 8.1 Page 148, NCERT book, Biology - XII

22. (i) AIDS (Acquired Immuno Deficiency Syndrome)

(ii) HIV (Human Immunodeficiency Virus)

(iii) Helper T-cells, macrophages, B-lymphocytes.

(iv) **Preventive measures :**

(a) People should be educated about AIDS transmission.

(b) Disposable needles and syringes should be used

(c) Sexual habits should be changed immediately

(d) High-risk groups should be discouraged from donating blood.

(e) Routine screening may be done.