Chapter 8
Human Health and Disease

1 Marks Questions

1.Name the diagnostic test which confirms typhoid.
Ans. Widal test

2. Name the two major groups of cells required to attain specific immunity.
Ans. B-lymphocytes and T-lymphocytes.

3. You have heard of many incidences of Chickengunya in our country. Name the vector of the disease.
Ans. Aedes mosquitoes.

4. Breast fed babies are more immune to diseases than the bottle fed babies. Why?
Ans. The mother's milk consists of antibodies (Ig A) such antibodies are not available to bottle fed babies.

5. Name the pathogen which causes malignant malaria.
Ans. Plasmodium falciparum.

7. What is the reason of shivering in malarial patient?
Ans. After sparozoite infection, when RBC ruptures, a toxic substance haemozoin is released which cause chilling and high fever.

8.When is a tumour refered to as malignant?
Ans. A tumour is said to be malignant when grows rapidly, invade & damage the surrounding normal tissues.

9.Why does an AIDS patient suffer from many infections?
Ans. Because in AIDS patient, immune system greatly weakens & cannot fight against any infection.

10.Name two curable sexually transmitted diseases?
Ans. Gonorhoea & Syphillis

11.Name the type of cells that produce antibodies?
Ans. B – lymphocytes.

12.Give the scientific name of causative germ of elephantiasis?
Ans. Wuchereria bancrofti.

13.Name the fish that help in eradication of mosquito larvae.
Ans. Gambusia

2 Marks Questions

1. Where are B-cells and T-cells formed? How do they differ from each other?
Ans. 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.

2. 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
Ans. Salmonella : Common cold is not a matching pair.

3. What would happen to the immune system, if thymus gland is removed from the body of a person?
Ans. T-lymphocytes are developed and matured in thymus gland, Immune system will become weak on removal of thymus gland.

4. Lymph nodes are secondary lymphoid orgAns. Describe the role of lymph nodes in our immune response.
Ans. 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.

5. What is the role of histamine in inflammatory response? Name few drugs which reduce the symptoms of allergy.
Ans. 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.

6.Differentiate between two different types of tumours?
Ans.

BENIGN TUMOUR	MALIGNANT TUMOUR
i) tumour remain confined to place of origin or affected organ	i) tumour invade surrounding tissue & spread throughout the body.
ii) It is harmless	ii) It is harmful
iii) rate of growth of tumour is low	iii) rate of growth of tumour is rapid
iv) causes limited damage	iv) Cause uncontrolled damage.

7.What do you mean withdrawal Symptoms? What are its characteristics?
Ans. Withdrawal symptoms refers to the characteristic unpleasant symptoms by body of a drug addict if regular dose of drug is abruptly discontinued. These include anxiety, shakiness, sweating, restlessness, depression, muscular cramps etc.

8.Differentiate between active & passive immunity?
Ans.

ACTIVE IMMUNITY	PASSIVE IMMUNITY
i) when antibodies are developed by our own cells in response to antigen	i) when antibodies developed in other vertebrates in response to deliberate infection of antigen
ii) It takes time to develop immunity	ii) It is used when the immune response has to be faster
iii) It stays for longer period	iii) It stays for short period

9.Enumerate the two properties of cancer cells that distinguish them from normal cell.
Ans. i) uncontrolled proliferation of cells without any differentiation
ii) Ability of these cells to invade other tissues called metastasis.

10.What are allergens? How do they cause inflammatory response inside human body?

Ans. The substance which causes the hypersensitive reaction of the immune system is called an allergen eg. dust, pollen grains etc. These allergens are actually weak antigens. First exposure to allergen does not cause allergy but consequent exposure, allergen combines with Ig E on mast cell. That causes cells to burst & release Histamines which cause inflammatory response.

11.What are autoimmune diseases? Give two examples?

Ans. Immunity is based on ability to differentiate foreign organism from self cells. Sometimes immune system may go off the track & turns against self antigen and elicit immunity. Such conditions are called auto – immune diseases eg. Rheumatoid arthritis, Myasthenia gravis.

3 Marks Questions

1. What are Cannabinoids? From which plant Cannabinoids are obtained? Which part of the body is affected by consuming these substances?

Ans. – 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.

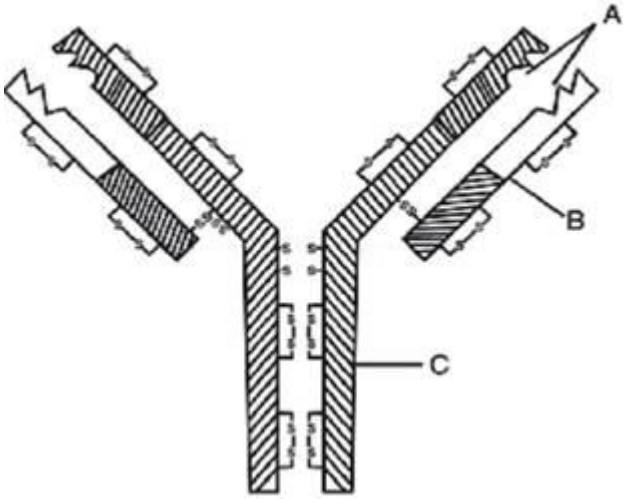
– The substances affect the cardiovascular system adversely

2. 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.



Ans.(a) A-Antigen binding site B-Light chain

(b) B-lymphocytes.

(c) Heavy Chain

(d) Antibodies provide acquired immune response.

3. Mention any three causes of drug abuse. Suggest some measures for the prevention and control of drug abuse.

Ans. 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

4. 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.
Ans.(a) Allergy **(b)** Allergens
(c) Mast Cells – Histamine, Serotonin

5. 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
Pneumonia	Streptococcus	(1)
Typhoid	(2)	High fever, weakness,headache, stomach pain
(3)	Rhinoviruses	Nasal Congestion, anddischarge sorethroat cough, headache
Ascariasis	Ascaris	(4)
Ringworm	(5)	Dry, Scaly lesions onvarious body parts,Intense itching, redness.
(6)	Entamoebahistolytica	Constipation, cramps,abdominal pain, Stoolswith excess mucous andblood clots.

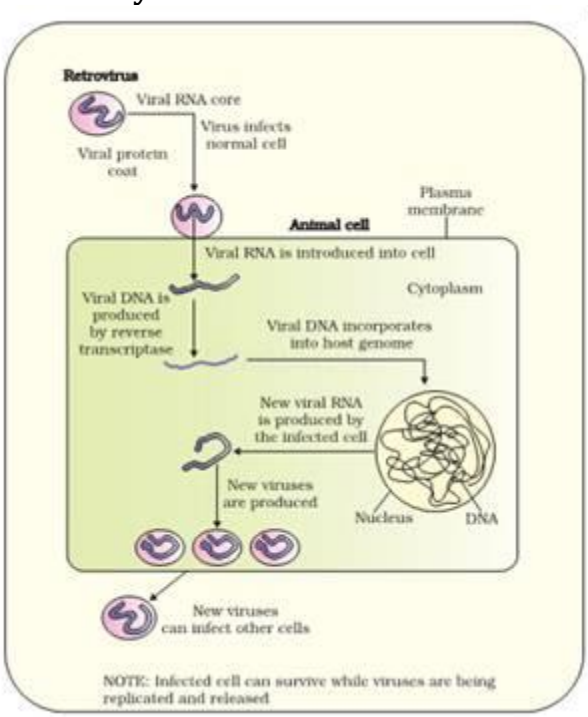
Ans.(i) Alveoli filled with fluid, reduced breathing, fever, chills, cough and headache.
(ii) Salmonella typhi
(iii) Common Cold
(iv) Internal bleeding, muscular pain, anaemia, fever and blockage of the intestinal passage.
(v) Microsporum species/Trichophyton species/Epidermophyton Species.
(vi) Amoebiasis/amoebic dysentery

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

8.How does humoral immune system works when our body is infected?
Ans. Humoral immune response is one in which antibodies are developed which are capable of attacking microbes. Each B-cell has receptors on its surface that recognize a specific antigen. Initial exposure of B-cell to Antigen triggers B-cells to proliferate

forming a large clone cell continuous stimulation increases the number of B-lymphocytes which differentiates into smaller antibody producing plasma cells. Each clone of plasma cells manufactures antibodies that specifically react with antigenic determinant that stimulated the initial proliferation. The antibody binds to antigen-forming an antigen-antibody complex which is later digested by phagocytic cells. Some of these plasma cells develops into memory cells which rapidly differentially into plasma cells on later exposure to same antigen.

9.It was diagnosed by a specialist that the immune System of the body of a patient has been suppressed. Describe the infection & the mechanism of its proliferation in the body.



Ans. If the immune system of the patient is found to be suppressed, he is found to suffer from human immunodeficiency virus (HIV). The HIV virus enters into helper T- cells & replicate to produce progeny viruses. The replication of virus involves:-
(i)After viral capsid enters the cell enzyme reverse transcriptase copies single stranded RNA into complementary DNA.
(ii)The RNA is degraded lay ribonuclease H & the DNA strand is duplicated to form double – stranded DNA.
(iii)Proviral DNA is integrated into cells DNA through a complex sequence of reactions catalysed lay Integrase enzyme.
(iv)Once the virus has infected the cell, virus becomes active & large number of virus particles are liberated that can infect other cells.

10.What are carcinogens? What are the different types of carcinogens? Also mention the different methods of treatment of cancer?
Ans. The things that cause cancer are called CARCINOGENS. These agents may be chemical or physical things like:-

1. Smoking
2. Tobacco chewing
3. Radiations eg. uv- x-ray, cosmic rays.
4. Chemical eg. mustard gas, aflatoxin, cadmium oxide

5. Biological agents eg. retroviruses
6. Cellular agents proto-oncogenes which when activated under certain condition may lead to oncogenic transformation of cells.

Treatment of cancer involves :-

1. SURGERY :- surgical removal of tumour
2. CHEMOTERAPY : treatment with drugs that can destroy cancer cells
3. IMMUNOTHERAPY : use of interferons, interleukin, vaccines to generate non-specific defense mechanism
4. RADIATION THERAPY :- x-ray therapy or radiotherapy use of ionizing radiations to kill cancer cells.
5. HARMONAL SUPPRESSION : providing or blocking certain hormones.

11.Describe the ill – effects of drug abuse in males & females. Also mention the preventive measures that is to be taken to reduce such effects.
Ans.1) ILL – DEFECTS IN MALES :- acne, increased aggressiveness , mood swing depression reduction of size of testicles, decreased Sperm production, kidney & liver dysfunction, premature baldness.
2) ILL – EFFECTS IN FEMALES :-masculinisation, increased aggressiveness, mood swings, depression abnormal menstrual cycle, excessive hair growth on face & body & deepening of voice.
The following measures are need to be taken to prevent such problems :-

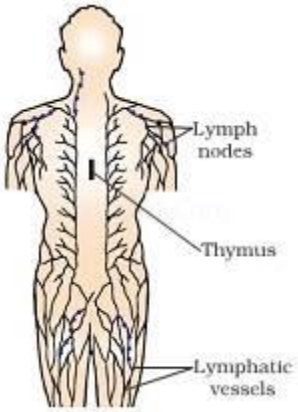
1. EDUCATION & COUNSELLING :- to face problem or stress, to accept failure as part of life & to channelize child's energy to some health promoting activities.
2. AVOID UNDUE PEER PRESSURE :- to pressurize a child to perform beyond his capabilities
3. SEEKING HELP FROM PARENTS &PEERS :- to share the feeling of anxiety & guilty.
4. SEEKING PROFESSIONAL FOR MEDICAL HELP :- help available in the form of highly qualified psychiatrist, psychologist etc.

12.What is vaccination? What type of immunity is provided by vaccination?
Ans. Vaccination is a process of development of immunity with administration of vaccines in the body, here weakened pathogen are infected into the body to produce immunity against a particular pathogen. This pathogen stimulates the body to produce antibodies. The antibodies produced against these antigens would neutralize the pathogenic agent. The vaccine also generates memory B – and T – cells that recognize pathogen quickly on subsequent exposure & overwhelm the invaders with massive production of antibodies.
The type of immunity is ACTIVE IMMUNITY.
However, if a person is infected with some deadly microbe to which quick immune response is required, we need to directly injected to patient's body, This type of immunization is called PASSSIVE IMMUNISATION.

5 Marks

1.Discuss the role of lymphoid organs in the immune response. Explain the different types of lymphoid organs giving two examples of each type in humans.
Ans. Lymphoid organs are organs where origin or maturation & proliferation of

lymphocytes occurs. These lymphoid organs are of two types:-
1.PRIMARY LYMPHOID ORGAN: – where immature lymphocytes differentiate into antigen – sensitive lymphocytes. It includes :-

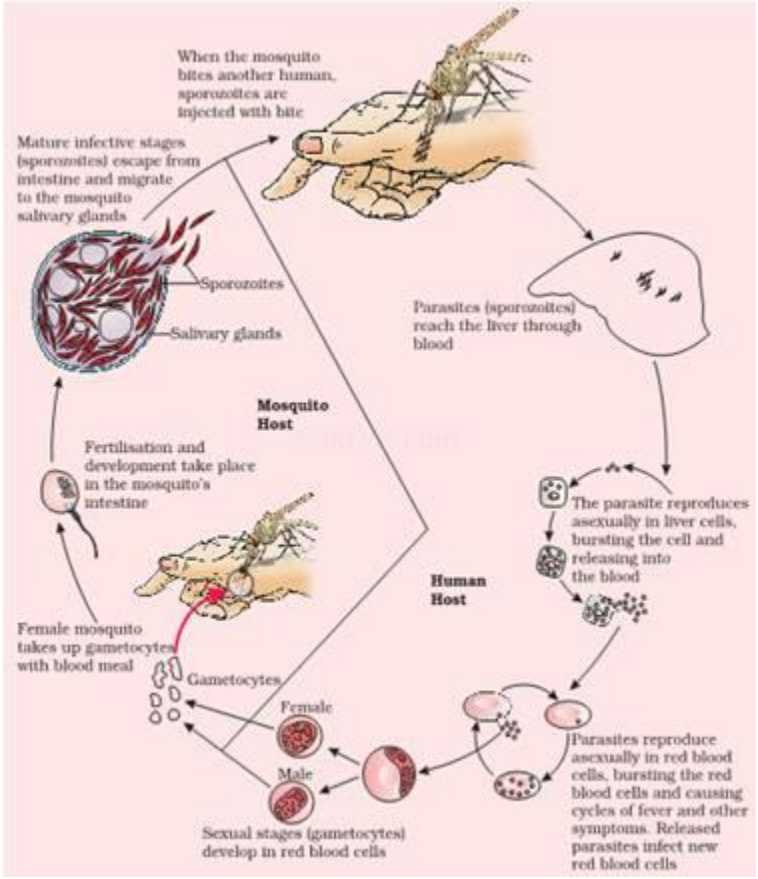


(a)BONEMARROW :– It is the main lymphoid organ present in the thigh region where all types of blood cells including lymphocytes are formed. It provides micro – environment for the development & maturation of B – cells.
(b)THYMUS :- It is located beneath the chest bone near heart. It provides microenvironment for the development & maturation of T – lymphocytes.
2.**SECONDAR LYMPHOID ORGAN :-** They provide the site for interaction of lymphocytes with antigen which then proliferate to become effector cells. It includes.
(a)SPLEEN :- It is large bean shaped organ & contains mainly lymphocytes & phagocytes. It acts as a filter of blood by trapping blood – bound micro – organism.
(b)**LYMPHNODE :-** They are small – solid structure located at different points along lymphatic system. It serves to trap antigen which happens to get into lymph & tissue fluid. Antigen trapped in lymph nodes are responsible for activation of lymphocytes,

5.With the help of a well – labelled diagram, Describe the life cycle of malarial parasite.
Ans. Malaria is caused by plasmodium vivax. It has two hosts – female anopheles is the vector of plasmodium while the primary host is man where the parasite maintains an amoeboid stage in RBCS & later produces gametophyte.
Life cycle of plasmodium involves following steps:-

1. The sporozoites enters the human body, reach the liver through blood & multiply within the liver cells such liver cells burst & release the parasites into blood.
2. They attack RBCS, multiply & cause their rupture.

The rupturing of RBCS is associated with the release of a toxin called haemozoin, which is responsible for recurring fever & the chill / shivering.



1. Gametophytes are developed in RBCS.
2. When a female anopheles mosquito bites an infected person, these parasites enter the mosquito's body & undergo further development. These parasites multiply within then in the stomach & develop a cyst.
3. The cyst produces sporozoites which reach salivary gland of mosquito. When such infected Anopheles sucks blood of a healthy person, it transfers. Sporozoites to repeat amoeboid stage again.