

Syllabus

- 10.0 Introduction
- 10.1 Immunity
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- 10.3 Common Human Diseases
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- 10.5 Addiction
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10.0 Introduction

Intext

Q.1 Can you recall?

i. Generally individuals are conscious about their health. So define health.

Ans: Health is defined as the state of complete physical, mental and social well-being and not merely the absence of disease or infirmity.

ii. Define infectious and non infectious disease? Give their examples.

Ans:

a. Infectious disease: The diseases which are transmitted from infected person to another healthy person either directly or indirectly, are known as infectious or communicable diseases. e.g. Malaria

b. Non-infectious diseases: The diseases that cannot be transmitted from infected person to another healthy person, either directly or indirectly are known as Non-Communicable or Non-Infectious diseases. e.g. Cancer and deficiency diseases.

TEXTUAL

Q.2 Define health.

Ans: Refer Q.1 (i)

Q.3 Enlist necessary factors for achieving

Human Health and Diseases

good health.

Ans: To achieve good health, it is therefore, necessary that we have hygienic balanced diet, clean drinking water, personal and community hygiene, regular physical exercise, knowledge about diseases and their effect on body, proper disposal of waste and control of vectors.

Q.4 What is 'immune system'?

Ans: The system which protects us from various infectious agents, is called **immune system**.

Q.5 What do you mean by resistance to infectious agents.

Ans: Resistance is the ability to prevent the damage or disease, through our defense mechanism.

10.1 Immunity

Q.6 Define 'Immunology'.

Ans: **Immunology** is a branch of science which deals with the study of immune system, immune responses to foreign substances and their role in resisting infection by pathogens.

Q.7 What are antigen and antibodies?

Ans:

i. Any foreign substance invading body and capable of stimulating an immune response, is called an **antigen**.

ii. The protective chemicals produced by immune cells in response to antigens are called **antibodies**.

Q.8 Who started the concept of immunity.

Ans: The concept of immunity is believed to be started by Edward Jenner in England.

***Q.9 Describe the different types of immunity.**

Ans: There are two types of immunity as Innate or Inborn (inherited) immunity and Acquired or Adaptive immunity.

A. Innate immunity or Inborn immunity:

- i. Innate immunity is the resistance to infections that an individual possesses by virtue of his or her genetic make-up.
- ii. It is the natural (inborn) defense system of the body.
- iii. It is not affected by prior contact with microorganisms or immunization.
- iv. It is nonspecific, when it indicates a degree of resistance to infection in general, or specific where resistance to a particular pathogen is concerned.
- v. One form of innate immunity comprises the various types of barriers which prevent entry of foreign agents into the body.a.

1. Epithelial surface :

- i. The intact skin and mucous covering the body, protect it considerably against invasion by microorganism(s).
- ii. The healthy skin possesses bactericidal activity due to the presence of high concentrations of salt in drying sweat.
- iii. Sebaceous secretions and long chain of fatty acids have bactericidal and fungicidal properties. The mucosa of the respiratory tract has several innate mechanisms of defense.
- iv. The nose prevents entry of microorganisms to a large extent, the inhaled particles being arrested through hair at or near the nasal orifices.
- v. Those that pass beyond are held by mucus lining the epithelium and are swept back to pharynx where they tend to swallowed or coughed out.
- vi. The cough reflex is an important defence mechanism of respiratory tract.
- vii. The mouth is constantly bathed in saliva which has inhibitory effect on microorganisms.
- viii. The acidity of gastric secretions in the stomach destroys microorganisms.
- ix. The flushing action of urine eliminates

bacteria from the urethra. Spermine and zinc present in semen are antibacterial.

2. Antimicrobial substances in blood and tissues:

- i. The complement system contains more than 30 serum proteins, circulating in the blood in an inactive state.
- ii. The presence of microbial pathogens activates the 'Complement cascade' to eliminate pathogens.
- iii. The interferons are a class of cytokines (soluble proteins) released by virally cells infected with viruses and certain white blood cells to stimulate other cells to protect themselves from viral infection.

3. Cellular factors in innate immunity :

- i. Natural defence against the invasion of blood and tissues by microorganisms and other foreign particles, is mediated to a large extent by phagocytic cells which ingest and destroy them.
- ii. Phagocytic cells (discovered by Metchnikoff in 1882) are grouped as microphages and macrophages.
- iii. They remove foreign particles that enter the body. A class of lymphocytes called Natural killer (NK) cells is important in nonspecific defence against viral infections and tumors.

4. Fever :

- i. Increase in the body temperature following the infection is a natural defense mechanism.
- ii. It helps to accelerate the physiological processes to destroy the invading pathogens. Fever stimulates the production of interferon and helps in recovery from viral infections.

5. Acute phase proteins (APPs):

- i. Infection on injury leads to a sudden increase in concentration of certain plasma proteins, collectively called acute phase proteins.
- ii. These include C Reactive Protein (CRP), Mannose binding protein, Alpha-1-acid glycoprotein, Serum Amyloid P, etc.
- iii. APPs are believed to enhance host

resistance, prevent tissue injury and promote repair of inflammatory lesions.

B. Acquired immunity:

- i. The resistance that an individual acquires during life is known as “Acquired immunity”. It is also known as Adaptive or Specific immunity”.
- ii. It involves the formation of antibodies in the body, which neutralize the antigens.

Q.10 State the unique features of acquired immunity.

Ans: Following are the unique features of required immunity.

- i. **Specificity:** It can produce specific antibody or T-lymphocyte against a particular antigen/pathogen.
- ii. **Diversity:** It can recognize a vast variety of diverse pathogens or foreign molecules.
- iii. **Discrimination between self and non self:** It differentiates between own body cells (self) and foreign (non-self) molecules.
- iv. **Memory:**
 - a. When the immune system encounters a specific foreign agent for the first time, it generates an immune response and eliminates the invader.
 - b. This is called first encounter.
 - c. The immune system retains the memory of the first encounter.
 - d. As a result, a second encounter with same pathogen brings about quicker and stronger immune response.

Q.11 Distinguish between the following:

- i. **Innate and acquired immunity.**

Ans:

No .	Innate immunity or Non-specific	Acquired or Specific immunity
a.	It is present since birth.	It develops after birth during the life time of an individual.
b.	It is inheritable immunity.	It is non-inheritable immunity.
c.	It is not acquired from previous exposure to a pathogen.	It is either short lived or may persist throughout the life.
d.	It remains throughout the life.	It is either short lived or may persist throughout the life.
e.	It is non-specific for any particular pathogen.	It is specifically produced against a particular pathogen.
f.	It consists of various types of barriers for defense.	It consists of various types of cells producing.

- ii. **Active immunity and passive immunity.**

Ans:

No.	Active Immunity	Passive
a.	When resistance developed by individuals as a result of an antigenic stimulus it is called as active immunity.	When ready-made antibodies are directly given to protect body against foreign agents, immunity is called as 'Passive immunity'.
b.	The types of active immunity are natural acquired active immunity and artificial acquired active immunity.	The types of passive immunity are natural acquired passive immunity and artificially acquired passive immunity.
c.	It has no side effects.	It may cause reaction.
d.	It provides relief only after long period.	It provides immediate relief.
e.	It is long lasting immunity	It is short-lived immunity.
e.g.	Polio vaccine, BCG vaccine etc.	Rabies vaccine, maternal antibodies, etc.

Q.12 Write a note on role of tears in immunity?

Ans:

- i. The conjunctiva is freed of foreign particles by the flushing action of lachrymal secretions.
- ii. Eyes become susceptible to Infection when lachrymal secretion is absent.
- iii. Tears contain the antibacterial substance Lysozyme (Ist described by A. Fleming).
- iv. This is a thermolabile, low molecular weight, basic protein which acts as a

muramidase.

- v. Lysozyme is active only against some pathogenic Gram +ve bacteria.

Q.13 Write a note on different types of cells associated with acquired immunity.

Ans: There are two main types of cells involved in the working of Immune system. They are (a) Lymphocytes and (b) Antigen Presenting cells.

1. Lymphocytes:

- i. Lymphocytes are the main cells of the immune system.
- ii. They, like the other blood corpuscles, arise from the stem cells, the haemocytoblasts, present in liver of the foetus and in the bone marrow in adult.
- iii. Some of them undergo differentiation in the gut –associated bursal lymphoid tissues (Tonsils, Peyer’s patches) and are called **Bursal** or **B-lymphocytes**; others are differentiated in the thymus gland and are termed as **T-lymphocytes**.
- iv. The mature lymphocytes pass into body fluids (blood and lymph) and circulate in the body. Many of them stay in the lymph nodes.
- v. The B-lymphocytes and T-lymphocytes form humoral or antibody-mediated immune system (AMIS) and cell-mediated immune system (CMIS) respectively.
- vi. Both the immune systems need antigens to come into action, but they respond in different ways.
- vii. On coming in contact with an antigen, a T-lymphocyte forms clones of T-cells which are similar but they perform different functions.
- viii. The clone has four types of T-lymphocytes:
 - a. **Helper T-cells:** Sensitized helper T-cells produce lymphokines for performing several types of functions like proliferation of other T-cells, stimulation of B-lymphocytes, macrophages, etc.
 - b. **Killer T-cells or Cytotoxic T-cells:** They directly attack and destroy

invading microbes, infected body cells and cancer cells. Killer T-cells bind to infected cell and secrete perforins. Then perforins form a hole in infected cell. It also releases substances that kill the cell, hence the name cytotoxic T-cell.

- c. **Suppressor T-cells:** These cells suppress entire immune system against attack on the own body cells.
- d. **Memory T-cells:** These are previously sensitized cells which retain the sensitization memory for long time in the future.

2. Antigen Presenting cells:

- i. Antigen presenting cells engulf invading pathogens and process the antigens.
- ii. Then the processed antigens are presented on their own surface.
- iii. These cells are able to deliver a stimulatory signal that is necessary for activation of helper T-cell.

Q.14 Which cell stimulate B-cells to form antibodies?

Ans: Helper T cells stimulate B cells to form antibodies.

Q.15 What do the abbreviations AMIS and CMIS denote?

Ans:

- i. **AMIS:** Antibody mediated immune system.
- ii. **CMIS:** Cell mediated immune system.

Q.16 Explain the mechanism of action of β -lymphocytes to antigens.

Ans:

- i. B-lymphocytes are sensitized directly by both antigens as well as by helper T-cells.
- ii. Activated B-lymphocyte multiplies very fast to produce clone of plasma cells and memory B-cells.
- iii. The plasma cells produce specialized glycoproteins, called antibodies which are circulated through body fluids (humor) like blood and lymph.

- iv. The antibody molecules may bind to a cell membrane or they remain free.

Q.17 Differentiate between B-cells and T-cells.

Ans:

No.	B-cells	T-cells
i.	B-cells mature in bone marrow.	T-cells mature in the thymus gland.
ii.	They are involved in humoral immunity.	They are involved in cell mediated immunity.
iii.	B cell originate and mature in bone marrow.	T cells originate in bone marrow and mature in thymus.
iv.	They occupy 20% of total lymphocytes	They occupy 80% of lymphocytes
v.	B-cells produces specific plasma cells which produce antibodies.	T-cells produce clone T-cells and can kill the infected cell.

Q.18 Enlist the main functions of free antibodies.

Ans: The free antibodies have three main functions:

- i. **Agglutination** of particulate matter, including bacteria and viruses. The immobilized mass is then engulfed by phagocytes.
- ii. **Opsonisation** or coating of bacteria to facilitate their subsequent phagocytosis by macrophages.
- iii. **Neutralization** of toxins released by bacteria e.g. tetanus toxin. Each antibody is specific for a particular antigen.

Q.19 Can you tell? Which is kind of immunity provided by vaccination?

Ans: Artificial acquired active immunity is provided by vaccination.

Q.20 Can you recall?

i. Why are vaccines considered as antigen containing material?

Ans:

- a. Vaccine is the 'antigen' containing material given to acquire either permanent or temporary immunity against a specific pathogen or disease.
- b. Traditionally, vaccines were prepared with the help of pathogens i.e. completely or partially killed pathogens were used as vaccines.
- c. This antigen helps the body's immune system to recognize and fight the actual pathogens like viruses or bacteria when they are actually encountered. Since, vaccines are made up of antigenic preparations, they are considered as antigen containing material.

ii. How are vaccines produced?

Ans: Vaccines are biological preparations used to develop an immune response in an individual against a particular pathogen.

- a. Vaccines are made using disease-causing viruses or bacteria.
- b. First step in vaccine production is antigen generation (i.e. proteins responsible for provoking immune response). Viruses are grown in primary cells (e.g. chicken eggs for the influenza vaccine), bacteria is grown in bioreactors.
- c. Antigens are then isolated from the cells and used to create the vaccine. In certain cases, live, weakened (which have lost their disease causing ability) or killed pathogens may also be used as vaccines.
- d. Later, vaccine is made by adding adjuvant, stabilizers and preservatives. Adjuvants increase immune response generated against the antigen; stabilizers increase the vaccine's storage life; and preservatives allow for the use of multi-dose vials.
- e. Vaccines are continually monitored for their safety.

iii. Who was Edward Jenner?

Ans: Edward Jenner discovered the vaccine for small pox. The concept of immunity was started by him, based on this vaccine.

Q.21 Write a note on importance of vaccination.

Ans:

- i. Administration of vaccine (i.e. inactivated pathogen or antigenic protection of particular pathogen) to protect against a particular pathogen, is called vaccination.
- ii. The body's immune system helps to protect against pathogens that cause infection.
- iii. It's an efficient system, most of the time, It either keeps microorganisms out or tracks them down and gets rid of them.
- iv. However, some pathogens can overwhelm the immune system.
- v. When this happens, it can cause serious illness. The pathogens most likely to cause problems, are the ones the body doesn't recognize.
- vi. Vaccination is a way to "teach" the immune system as to how to recognize and eliminate pathogenic organism.
- vii. That way, body is always prepared if you are ever exposed.
- viii. Vaccination is an important form of primary prevention, that can protect people from getting sick.
- ix. Vaccination has allowed us to control diseases like measles, polio, tetanus and whooping cough that once threatened many lives.
- x. It's important that as many people as possible get vaccinated. Vaccinations don't just protect individuals, when enough people are vaccinated. It also helps to protect the society.

Q.22 Explain the working of vaccination and different forms of vaccines.

Ans:

- i. Vaccination teaches the body to recognize new pathogens causing diseases.
- ii. It stimulates the body to make antibodies

- against antigens of pathogens.
- iii. It also primes immune cells to remember the types of antigens. This allows a faster response to the pathogen in future.
 - iv. Vaccines work by exposing you to a safe version of pathogen. Vaccines may be in the form of:
 - A protein or sugar from the pathogen.
 - A dead or inactivated form of a pathogen.
 - A toxoid containing toxin produced by a pathogen.
 - A weakened (attenuated) pathogen.

When the body responds to the vaccine, it builds an adaptive immune response. This helps to equip the body to fight off an actual infection.

TEXTUAL

★ **Q.23 Write a note on vaccination.**

Ans: Refer Q.21 and Q.22

Intext

Q.24 Internet my friend.

Find out different types of vaccines available in the market and their significance.

Ans: There are four main types of vaccines available in the market:

- i. **Live-attenuated vaccines:**
Live-attenuated vaccines use a weakened (or attenuated) form of a pathogen that causes a disease. Since these vaccines are so similar to the natural infection that they help prevent infection by creating a strong and long-lasting immune response.
Significance:
Since these vaccines introduce actual live pathogens into the body, it is an excellent simulation for the immune system. So live attenuated vaccines can result in lifelong immunity with just one or two doses.
e.g. vaccines against measles, mumps, rubella (MMR combined vaccine), Rotavirus, Smallpox, etc.
- ii. **Inactivated vaccines:**

Inactivated vaccines use the killed version of the germ that causes a disease. Inactivated vaccines usually don't provide immunity (protection) that's as strong as live vaccines. So you may need several doses over time (booster shots) in order to remain immune against diseases.

Significance:

These vaccines can be freeze dried and easily stored because there is no risk of killing the pathogen as there is with live attenuated vaccines. They are also safer, without the risk of the virus or bacteria mutating back into its disease-causing form. Thus, the inactive method is most often used for aggressive or fatal diseases. e.g. Vaccines against Hepatitis A, Polio, Rabies, etc.

iii. **Subunit, recombinant, polysaccharide, and conjugate vaccines:**

Subunit, recombinant, polysaccharide, and conjugate vaccines use specific pieces of the pathogen, like its protein, sugar, or capsid. Since these vaccines use only specific subunits of the pathogen, they give a very strong immune response which is targeted to key parts of the pathogen. They can also be used on almost everyone who needs them, including people with weakened immune system and long-term health problems.

e.g. Vaccines against Hib (*Haemophilus influenzae* type b.), Hepatitis B, HPV (Human papillomavirus), Whooping cough (part of the DTaP combined vaccine), Pneumococcal disease, Meningococcal disease, etc.

iv. **Toxoid vaccines:**

Toxoid vaccines use a toxin (harmful product) made by the germ that causes a disease. They create immunity to the parts of the germ that cause a disease instead of the germ itself. That means the immune response is targeted to the toxin instead of the whole germ. Toxoid vaccinations were created to help the body fight off infection and illness caused by

contaminaiton from thing like rust and sewage, which can cause diphtheria e.g. Vaccines agaist diphtheria, tetanus, etc.

v. **Conjugate vaccine:**

These vaccines help protect an individual from harmful bacteria that have and outer coating which makes them appear harmless. A harmful bacteria or virus is attached to the coating to stimulate the immune system into attacking the pathogen.

e.g. Vaccine against *Haemophilus influenzae* type B.

Q.22 Inernet my friend.

i. **Whether vaccination can be done during or before pregnancy?**

Ans: Yes, vaccinations can be done during or before pregnancy. There are certain vaccines that are recommended to be taken during pregnancy.

ii. **Will it be helpful to protect the mother and baby both?**

Ans: Vaccines can help protect both the mother and the baby from vaccine-preventable diseases. During pregnancy, vaccinated mother pass on infection-fighting proteins called antibodies to their babies.

iii. **Which vaccines can be administered before pregnancy? When can it be?**

Ans: The CDC prescribes a list of vaccines to be taken before a woman gets pregnant. This includes vaccines for rubella and hepatitis B.

Vaccines that are prescribed to be taken during pregnancy include vaccines against flu, whooping cough, etc. Women who are planning to get pregnant should be up to date with all the vaccines recommended by the CDC based on their age.

iv. **How will you increase awareness in the society on this issue?**

Ans: Awareness knowledge and attitude towards vaccination during pregnancy in women is very important. Woment should be educated about vaccination given during

pregnancy in order pregnancy in order to promote awareness and emphasize the importance of vaccination during pregnancy.

In orger to increase awareness in the society on this issue the following steps can be taken:

- Circulation of informational brochures/ leaflets.
- Awareness drives/ Street plays, with the help of friends, family etc.
- Spreading information by mouth to relatives and friends regarding the benefits of adult vaccinations.

Q.26 Explain that vaccinations are safe.

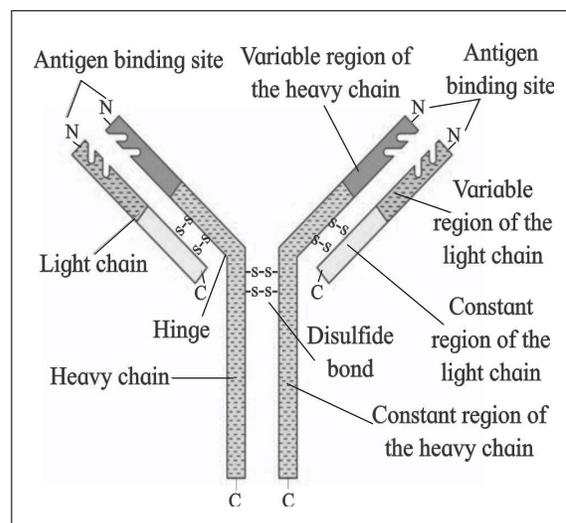
Ans:

- Vaccines are considered to be safe.
- They are rigorously tested and go through many rounds of study, examination, and research before they are used for the general public.
- Extensive research and evidence shows that vaccines are safe their side effects are rare and typically mild.

**10.2 Structure of Antibody
TEXTUAL**

★Q.27 Describe the structure of antibody.

Ans:



- i. Antibodies are glycoproteins which are highly specific to specific antigens.
- ii. They are also known as **Immunoglobulins (Igs)**, produced in response to antigenic stimulation.
- iii. Antibodies are produced by plasma cells which in turn are formed by B-lymphocytes.
- iv. The mature plasma cells produce antibodies at an extremely rapid rate i.e. about 2000 molecules per second.

Intext

Q.28 Find out.

Collect information about IgG, IgA, IgM, IgD and IgE antibodies from internet / reference book / teacher and prepare a chart / power point presentation.

Ans:

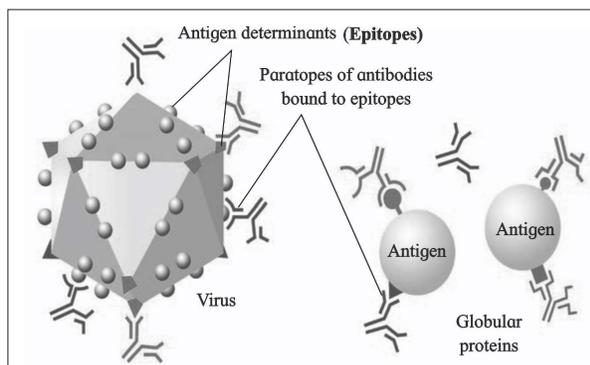
Property / Activity	IgG	IgA	IgM	IgD	IgE
Molecular weight	1,50,000	1,50,000 – 6,00,000	9,00,000	1,50,000	1,90,000
Heavy chain component	γ	α	μ	δ	ϵ
Normal serum level (mg / ml)	9	6	5	3	2.5
Crosses Placenta	Yes	No	Yes	No	No
Subtypes	IgG1, IgG2, IgG3, IgG4	IgA1, IgA2	–	–	–
% Constituent of total serum immunoglobulin	80%	10–15%	5–10%	0.2%	Low
Number of Monomers	1(Monomer)	2(Dimer)	5(Pentamer)	1(Monomer)	1(Monomer)
Other Properties	Role in secondary immune response	External secretions like breast milk, saliva, tears and mucus	First immunoglobulin produced in primary response to antigen.	Present on mature B cells.	Hypersensitivity reactions.

TEXTUAL

★Q.29 Write a note on antigen - antibody complex.

Ans:

- i. Each antibody is specific for a particular antigen.
- ii. Combining sites of antigen, called antigenic determinants (**epitopes**) react with the corresponding antigen binding sites of antibodies called **paratopes**.
- iii. The antigen binding sites (paratopes) are located on the variable regions of the antibody.
- iv. Small variations in the variable regions make each antibody highly specific for a particular antigen.
- v. The variable region enables the antibody to recognize the specific antigen and bind to specific antigen in a lock and key manner forming an antigen-antibody complex.



Q.30 What is serology.

Ans: Study of antigen - antibody interactions is called serology.

★Q.31 Differentiate between antigen and antibody.

Ans:

Sr. No.	Antigen	Antibody
i.	Any foreign material which brings about an immune response in the body is called antigen.	Glycoproteins formed in the body to fight against antigen is called antibody.
ii.	It triggers the formation of antibodies	It is produced against antigens
iii.	It may be a free molecule or component of microbial cell surface.	It is extruded from surface of plasma cells.
iv.	Structure of antigen is variable	Antibody Y-shaped.

★Q.32 Write a note on antigens on blood cells.

Ans:

- i. There are several known antigens on the surface of human red blood cells. These antigens give rise to different blood groups.
- ii. The A, B and O blood groups were discovered by Karl Landsteiner in 1900.
- iii. Later on, the blood group AB was discovered by Landsteiner's students Decastello and Sturli in 1902.
- iv. Landsteiner was awarded the Nobel prize for his discovery of human blood groups. He found two antigens or agglutinogens on the surface of human red blood cells and named them as antigen A and antigen B.

Blood group	Genotype	Antigen on Surface of RBC	Antibody in Serum	Can donate blood to	Can receive blood from
A	$I^A I^A$ or $I^A I^O$	A	Antibody b	A, AB	A, O
B	$I^B I^B$ or $I^B I^O$	B	Antibody a	B, AB	B, O
AB (universal acceptor)	$I^A I^B$	A and B	Nil	AB	A, B, AB, O
O (Universal donor)	$I^O I^O$	Nil	Both Antibody a and Antibody b	A, B, AB, O	O

v. He also noticed the corresponding antibodies or agglutinins in the serum called 'a' and 'b'. In ABO system, the blood groups are determined by the presence or absence of antigen A and antigen B, the blood group of person is classified into four groups A, B, AB and O.

a. **Blood group A :**

Individuals, with blood group 'A' have the antigen A on the surface of their red blood cells (RBCs) and antibody 'b' in their plasma.

b. **Blood group B :**

Individuals with blood group 'B' have the antigen B on the surface of their RBCs and antibodies 'a' in their plasma.

c. **Blood group AB :**

Individuals with blood group 'AB' have both antigens A and B on the surface of their RBCs and no antibodies in their plasma.

d. **Blood group O –**

Individuals with blood group 'O' lack both antigens A and B on the surface of their RBCs and show presence of both 'a' and 'b' antibodies in their plasma.

★Q.33 What is Rh factor?

Ans:

- i. Rh is the most complex of the blood group system.
- ii. Rh –factor is an antigenic protein present on the surface of the red blood cells in the human beings.
- iii. It was first discovered by Landsteiner and Wiener (1940), on the surface of RBCs of Rhesus monkey, so it is called Rh factor (also called D antigen).
- iv. Person having Rh factor (D antigen) are called Rh positive (Rh +ve) and those lacking D antigen are called Rh negative (Rh -ve).

Q.34 Write a brief note on erythroblastosis foetalis.

Ans:

- i. Rh (D) antigen induces a strong immunogenic response when introduced into Rh-ve individuals.
- ii. Rh blood group is an important factor in blood transfusion and is involved in haemolytic diseases of the newborn (HDN), which is called **erythroblastosis foetalis** (destruction of the erythrocytes of the foetus).
- iii. It occurs when an Rh -ve mother conceives Rh+ve foetus.
- iv. The Rh +ve RBCs from the foetus may enter the mother's circulatory system during child birth, causing her to produce anti-Rh antibodies.
- v. As a result, subsequent Rh+ve foetuses will be exposed to the anti-Rh antibodies produced by mother, which result in HDN.
- vi. In order to prevent HDN, Rh -ve mother is injected with the anti-Rh antibody during all pregnancies carrying Rh +ve foetus.

#Q.35 Can you tell?

i. **The blood group of Krutika is O Rh +ve. What would be the possible blood groups of her parents?**

Ans:

- a. The possible blood group of Krutika's parents are either A, B or O and at least one of them would have to be Rh positive. However, neither of them could be AB.
- b. A person who is blood type O has to be genetically OO (receiving a gene that codes for either A nor B from one parent and a gene that codes for neither A or B from another parent).
- c. Since Krutika will receive only one allele from both the parents, it is possible that her parents may be heterozygous $I^A I^O$ or $I^B I^O$. Also either of her parents must be Rh +ve as Rh factor is dominant and will be expressed even if one allele is present.
- d. Thus, the possible blood genotypes of the parents include $I^O I^O$, $I^A I^O$ or $I^B I^O$
- e. Also, a person who is blood subtype Rh

positive could be genetically either DD or Dd.

Thus, Krutika's parents could be genetically A (I^AI^O), B (I^BI^O) or O (I^OI^O) with atleast one of them must be DD or Dd (one parent could be dd or Rh negative).

ii. **Mrunmayi is called as universal blood acceptor. What is her blood group?**

Ans: Mryunmai has AB blood group.

#Q.36 Use your brain power.

Can a person with blood group O Rh⁺ donate blood to a patient with blood group O Rh⁻? Why?

Ans:

- i. No, a person with blood group O Rh⁺(donor) cannot donate blood to a patient with blood group O Rh⁻(recipient).
- ii. The Rh antibodies in the blood of the donor will induce the immune system of the recipient to produce anti-Rh antibodies.
- iii. There will be cross reactivity between the Rh antigen from the donor and the anti - Rh antibodies in the recipient.
- iv. This will result in hemolysis of RBCs in donor's blood and may cause adverse symptoms in the recipient.

10.3 Common Human disorders

Q.37 Define disease.

Ans: Disease is defined as condition of disturbed or deranged functioning of one or more organs or organ systems of the body, caused due to infections, defective diet or heredity.

Q.38 Write a note on categorizations of diseases.

Ans: All human diseases can be broadly categorized into **congenital** diseases and **acquired** diseases.

- i. **Congenital** diseases.
 - a. They are present from birth; may be caused by genetic abnormality or metabolic disorder.
 - b. They may be permanent and were

practically incurable.

- c. However, modern research has helped to cure some inborn diseases through gene therapy, enzyme replacement therapy, etc.

i. **Acquired** diseases

- a. They develop after the birth and can be subdivided into Communicable or infectious diseases or Non-Communicable or Non-infectious diseases.
- b. The diseases which are transmitted from infected person to another healthy person either directly or indirectly, are known as **Communicable** or Infectious diseases.
- c. Malaria and other diseases which are to be studied in this chapter, are examples of this type.
- d. The diseases that cannot be transmitted from infected person to another healthy one either directly or indirectly are known as **Non-Communicable** or Non - Infectious diseases.
- e. Cancer and deficiency diseases are examples of this type.

Q.39 What are acquired? diseases?

Ans: Refer Q.38 ii) a - e.

Q.40 Write a note on pathogen, vector, and pathogen.

Ans:

- i. Communicable diseases are caused by pathogens like viruses, bacteria, fungi, helminth worms, etc. All the disease causing organisms are called '**Pathogens**'.
- ii. Many pathogens use another organism, the '**Vector**' to reach us. These vectors are actually parasites which we regularly come across.
- iii. **Parasite** is an organism that lives in or on the body of another organism and derives its nutrition from that of host organism. Parasites are two categories viz. : a.

Ectoparasite E.g. bedbug b. Endoparasite.
E.g. Plasmodium is a protozoan endoparasite of the (vector) and human beings.

MALARIA

Q.41 Name the pathogen causing Malaria.

Ans: *Plasmodium* is the pathogen that causes malaria.

Q.42 Name the infective stage of Plasmodium. Give any two symptoms of malaria.

Ans:

- i. For humans, **sporozoites** are the infective stage of malaria.
- ii. Symptoms of malaria begin to appear about 7 to 15 days after the bite of infective mosquito.

- Initial symptoms are fever, headache, and chills, may be difficult to recognize as malaria.
- Classical symptoms of malaria is cyclic occurrence of high fever followed by sweating and sudden shivering. Such entire episode lasts for four to six hours and recurs every two days or three days.
- Vomiting and convulsions.
- Arthralgia (joint pain), anaemia due to rupturing of RBCs.
- Haemoglobinuria, hepatomegaly (liver enlargement).
- Retinal damage (eye).
- Cerebral malaria (brain infection).

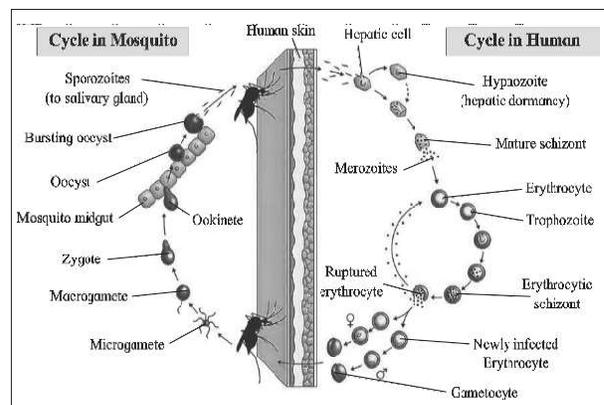
Q.43 Write a note on stages in the life cycle of Plasmodium in mosquito and human.

Ans:

- i. Plasmodium is transmitted from one person to other through an insect vector- female Anopheles mosquito.
- ii. When infected female Anopheles sucks the human blood, it may transfer sporozoites to human circulation.
- iii. Sporozoites reproduce asexually through fission (schizogony) in the liver cells or

erythrocytes.

- iv. The cells formed are now called merozoites.
- v. The cells formed within erythrocytes function as gametocytes (gamogony).
- vi. Besides, it forms gametocytes within erythrocytes (gamogony).
- vii. Gametocytes if taken up by female Anopheles, fertilization occurs in its gut. Diploid zygote is formed which transforms into oocyst.
- viii. Oocyst forms large number of haploid sporozoites through meiosis (sporogony). Sporozoites migrate to salivary glands and are ready to infect new human host.



Q.44 Explain diagnosis and treatment of malaria.

Ans:

- i. Malaria can be diagnosed by microscopic study of blood smear.
- ii. Besides, other rapid diagnostic tests based on nucleic acid amplification techniques are also used.
- iii. Treatment of malaria includes Artemisinin based combination therapies (ACTs).
- iv. WHO has recommended 5 different ACTs which include various combinations of artesunate, sulfadoxine, pyrimethamine, etc. In addition, quinine is also used.

Q.45 Enlist measures for prevention and control of malaria.

Ans:

- i. Prevention of mosquito bite by using

- ii. Spraying insecticides and draining stagnant water where mosquito lays eggs.
- iii. Mosquito larve can be controlled by using Gambusia fresh water fish (biocontrol).

TEXTUAL

★Q.46 What is schizont.

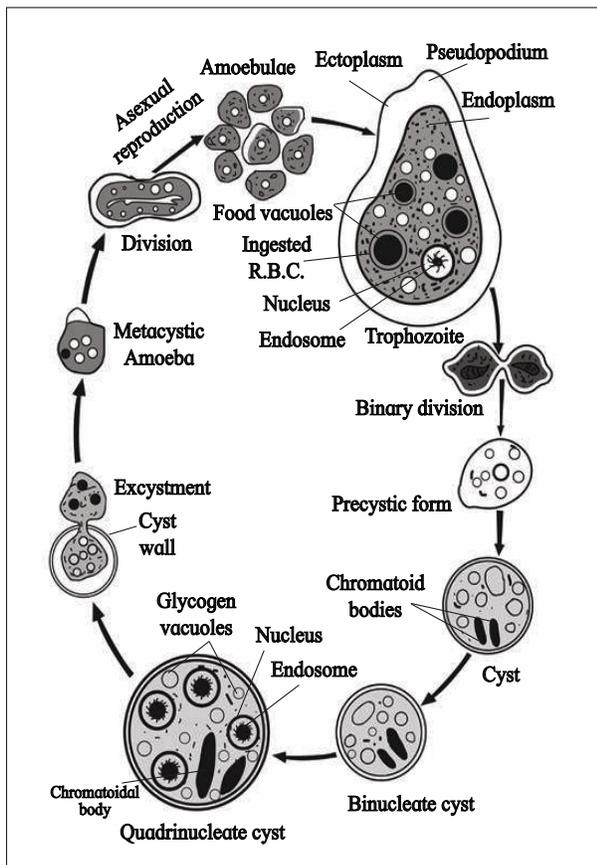
Ans: Schizont is a cell formed from a trophozoite during the asexual stage of the life cycle of **Plasmodium**.

Amoebiasis

Q.47 Write a detailed note on, symptoms, mode of transmission, Diagnosis, treatment and prevention of Amoebiasis.

Ans:

- i. Amoebiasis is also known as Amoebic dysentery. It's a common infection of human gastro-intestinal tract, which affects 15 % population of India.



- ii. **Signs and symptoms:**
 - a. Diarrhoea, flatulence, stool with mucus and abdominal pains (cramps) are common.
 - b. Passing of blood with stool is common in severe cases.
 - c. Hepatomegaly occurs if parasite enters the liver. Liver develops amoebic liver abscess accompanied with fever and pain in right abdomen.
- iii. **Mode of transmission :**
 - a. Faeco-oral route.
 - b. Eating with dirty hands.
 - c. Contaminated food and water.
- iv. **Diagnosis and Treatment :**
 - a. Diagnosis of amoebiasis is made through microscopic examination of the stool sample.
 - b. Amoebiasis is treated by the use of Metronidazole and Tinidazole which can destroy the *E. histolytica* in the digestive tract as well as other tissues.
- v. **Prevention and Control :**
 - a. Wash hands with hot water and soap after using toilets and changing baby's diaper.
 - b. Drink boiled water. Otherwise, water must be chlorinated and filtered. Avoid eating unhygienic food.
 - c. Vegetables must be properly washed and cooked.
 - d. Proper sanitary facilities including sewage disposal help in prevention.

Q.48 Internet my friend.

Gather information about trophozoite and its occurrence in the life cycle of other parasitic protozoans.

Ans:

i. ***Giardia duodenalis* (Flagellated protozoan):**

Cysts are resistant forms and are responsible for transmission of Giardiasis. Both cysts and trophozoites can be found in the faeces (diagnostic stages).

In the small intestine, excystation releases trophozoites (each cyst produces two trophozoites).

Trophozoites multiply by longitudinal binary fission, remaining in the lumen of the proximal small bowel where they can be free or attached to the musosa by a ventral sucking disk.

Encystation occurs as the parasites transit toward the colon.

Since the cysts are infectious when passed in the stool or shortly afterward, person - to - person transmission is possible.

ii. ***Balantidium coli* (Ciliated protozoan):** Cysts are the stage responsible for transmission of balantidiasis.

The host most often acquires the cyst through ingestion of contaminated food or water.

Following ingestion, excystation occurs in the small intestine, and the trophozoites colonize the large intestine.

The trophozoites reside in the lumen of the large intestine and appendix of humans and animals, where they replicate by binary fission, during which conjugation may occur.

Trophozoites undergo encystation to produce infective cysts.

Some trophozoites invade the wall of the colon and multiply, causing ulcerative pathology in the colon wall.

Some return to the lumen and disintegrate. Mature cysts are passed with feces.

Q.49 What are the methods to prevent and control amoebiasis.

Ans: Refer Q.47 v.

Q.50 Write a note on symptoms abserved in Amoebiasis.

Ans: Refer Q.47 ii.

Ascariosis

Q.51 What is Ascariosis?

Ans: It is an infectious disease of human intestinal tract, caused by roundworm- *Ascaris lumbricoides*. *Ascaris lumbricoides* is an endoparasitic round worm or nematode.

Q.52 Enlist the signs and symptoms of Ascariosis.

Ans:

- i. Gastro-intestinal discomfort accompanied with vomiting and fever.
- ii. Presence of live worms in feecal matter.
- iii. Pulmonary disorders occur in some patients. Pneumonitis (inflammation in alveolar wall).
- iv. Loss of apetite and weight loss.
- v. Eosinophilia (number of eosinophils is increased).

Q.53 Write a note on mode of transmission of Ascariasis.

Ans:

- i. Food and drinks contaminated with the eggs of these worm is the main mode of transmission.
- ii. Eggs hatch inside the intestine of the new host.
- iii. The larvae pass through various organs and settle as adults in the digestive system.

Q.54 Write a note on treatment and prevention of Ascariasis.

Ans:

- i. **Diagnosis and Treatment:**
 - a. Diagnosis can be done by microscopic examination of the stool.
 - b. Anti-helminthic drugs like Piperazine, Mebendazole, Levamisole, Pyrantel are effective against *Ascaris lumbricoides*.
- ii. **Prevention and Control :**
 - a. Avoiding defaecation in open space, prevents the spread of *Ascaris*.
 - b. Personal hygienic habits like washing hand with water and soap after using toilet are also important.
 - c. Washing vegetables throughly before cooking and avoiding raw vegetables is important for prevention of ascariasis.

Q.55 Draw a diagram of the lite cycle of *Ascoris Lumbricoides*.

Ans: Refer Q.53 for diagram.

Filariasis / Elephantiasis

Q.56 Write a note on Filariasis and its three types.

Ans:

- i. Filariasis is caused by thread like worms nematodes.
- ii. These nematode parasites are transported from person to person via mosquito bite.
- iii. Filariasis can be divided into 3 subtypes as
 - a) Lymphatic Filariasis,
 - b) Subcutaneous Filariasis (e.g. Loa loa, Mansonella spp.)
 - c) Serous (abdominal)cavity Filariasis (e.g. Mansonella spp.).

★Q.57 Name the vector of Filariasis.

Ans: Culex Mosquito transmits Wuchereria bancrofti to human body.

Q.58 Who causes Lymphatic Filariasis.

Ans: Lymphatic Filariasis (Elephantiasis) is caused by the worms - *Wuchereria bancrofti*, *Brugia malayi*, *Brugia timori*.

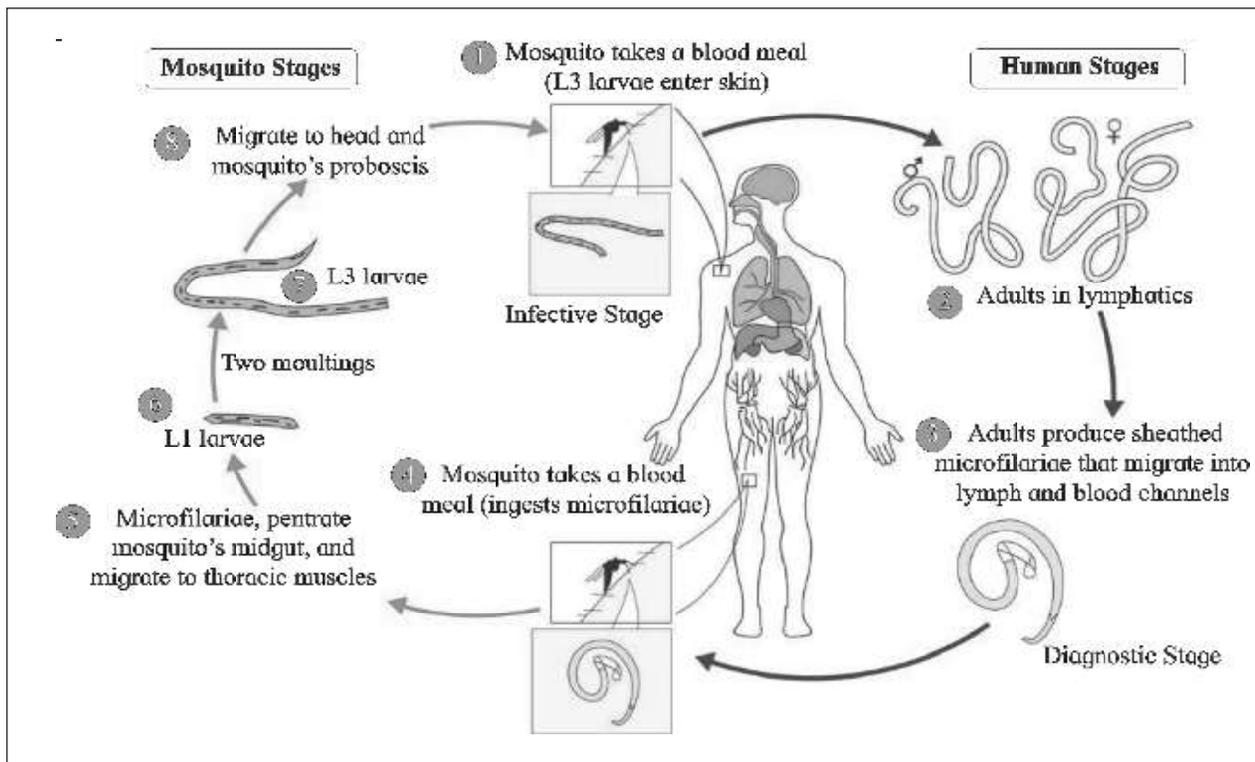
Q.59 List down the signs and symptoms of filariasis.

Ans:

- i. Edema with thickening of skin and underlying tissue.
- ii. *Wuchereria bancrofti* affects the legs, arms, breasts, scrotum, etc.
- iii. In lymphatic filariasis, worms infect lymphatic system and causes enlargement of lymph vessels and nodes. This is elephantiasis i.e. limbs are swollen like legs of elephant.
- iv. Lymphedema i.e. accumulation of lymph fluid in tissue causing swelling.

Q.60 Explain the mode of infection and cause of elephantiasis.

Ans:



Life cycle of *Wuchereria bancrofti*:

- i. *Wuchereria bancrofti* has a complicated life cycle which consists of five stages.
- ii. After mating of male and female gives birth to thousands of live **microfilariae**.
- iii. These microfilariae are taken up by vector insect (intermediate host), as blood meal.
- iv. In the intermediate host, microfilariae moult and develop into **3rd stage (infective) larve**, in the intermediate host.
- v. When the vector bites a healthy person, infectious larvae are injected in the dermis of the skin.
- vi. After about one year, the larvae moults through two more stages maturing into adult worms.

Mode of transmission :

Wuchereria bancrofti is transmitted to human body by female *Culex* mosquito. The larvae escape mosquito body and arrive on the human skin.

They penetrate the skin, undergo two moultings before they become adults and settle in the lymphatic system. Incubation period can be as long as 8-16 months.

Q.61 Write a note on diagnosis and preventions of filariasis.

Ans:

- i. **Diagnosis and Treatment :**
Use of diethyl -carbamazine citrate twice a day for three weeks and thereafter for five days every six month is effective against filarial worms.
- ii. **Prevention and Control :**
 - a. Avoid mosquito bite by using mosquito nets and insect repellents.
 - b. Eradication of mosquitoes is essential for control of filariasis.

Typhoid

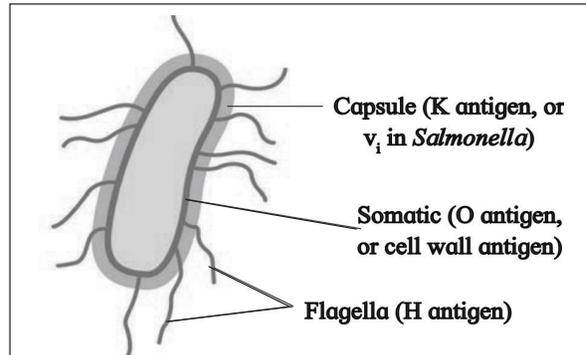
Q.62 Name the causative agent of typhoid fever?

Ans: *Salmonella typhi* is the causative agent of typhoid fever.

Q.63 What is Typhoid.

Ans:

- i. Typhoid is an acute infection of intestine. It is caused by *Salmonella typhi*.
- ii. It is Gram -ve bacteria found in intestinal lumen of infected preson.
- iii. Pathogenicity is due to “O”- antigen, a lipopolysaccharide (LPS), present on surface coat.
- iv. Flagella contains “H”- antigen.



Q.64 Enlist the signs and symptoms of typhoid.

Ans:

- i. Prolonged fever as high as 104°F.
- ii. General nausea, fatigue, headache.
- iii. Abdominal pain, constipation or diarrhoea.
- iv. Rose-coloured rash on skin.
- v. White coat on tongue, cough.
- vi. Anorexia (loss of appetite).
- vii. If not treated- breathlessness, irregular heartbeats, haemorrhage.

Q.65 Write a note on mode of transmission of typhoid.

Ans:

- i. It is a food and water borne disease.
- ii. Insects like housefly and cockroaches feeding on fecal matter, may transfer the bacteria to food material.
- iii. Poor hygiene habits and poor sanitation conditions are responsible for the spread of typhoid.

Q.66 Explain the diagnosis and treatment of typhoid.

Ans:

- i. Widal test is used for diagnosis of typhoid.
- ii. Treatment of typhoid involves surgical removal of gall bladder in severe cases.
- iii. Antibiotics like Chloromycetin is helpful treatment.
- iv. For prevention of typhoid WHO recommends two vaccines as oral (Ty21a vaccine) and injectable (Typhoid polysaccharide vaccine) sold as- typhim vi and typherix.

TEXTUAL

***Q.67 Write a short note on typhoid.**

Ans: Refer Q.62, Q.63, Q.64, Q.65, Q.66.

Pneumonia

Q.68 Write a note on pneumonia?

Ans:

- i. Pneumonia is an inflammatory condition of lungs or alveoli of lungs.
- ii. It is caused by a variety of pathogens which may be viruses like influenza virus, adenovirus, para influenza and Respiratory Syncytial Virus (RSV) or bacteria like Streptococcus pneumoniae or fungal pathogens e.g. *Pneumocystis jirovecii* and *Pneumocystis carinii*.
- iii. Pneumonia can also be caused by chemical burns or physical injury to lungs.

Q.69 Enlist the signs and symptoms for pneumonia?

Ans:

- i. Cough produces yellow or greenish sputum or phlegm.
- ii. High fever.
- iii. Shortness of breath (Dyspnea).
- iv. Chest pain during deep breath or coughing.
- v. Loss of appetite, fatigue, headaches, vomiting, joint pains and muscle aches.

Q.70 Explain mode of transmission of pneumonia?

Ans: Pneumonia mostly spreads by direct person to person contact. It can also spread via droplets released by infected person

or even by using shared clothes and utensils.

Q.71 How would you treat pneumonia.

Ans: Course of treatment depends upon pathogen leading to the disease. For bacterial pneumonia, antibiotics like Benzyl penicillin, Ampicillin and Chloramphenicol are effective.

Q.72 Write a note on prevention of pneumonia.

Ans:

- i. Vaccination is important prevention in both children and adults.
- ii. Vaccines against Haemophilus influenzae and Streptococcus pneumoniae in first year of life, help greatly to reduce the chances of causing Pneumonia.

Q.73 Internet my friend.

Find out other modes of infection by which a pathogen spreads from person to person.

Ans: Modes of spread of infection may be either direct or indirect.

i. Direct transmission:

It occurs through direct contact or droplet spread.

a. Direct contact:

Skin-to-skin contact, kissing, sexual intercourse. It also includes contact with vegetable or soil harbouring infectious organisms.

b. Droplet spread:

Sneezing, coughing, talking.

ii. Indirect transmission:

It occurs through airborne, vehicle borne or vector borne means.

a. Airborne transmission:

Infectious agents carried by dust or droplet nuclei suspended in air.

b. Vehicle borne transmission:

Food, water, biologic products (blood) and fomites (utensils, clothing, etc.)

c. Vector borne transmission:

Transmission through vectors like

fleas, mosquitoes, ticks, etc.

Common Cold

Q.74 What is common cold?

Ans:

- i. It is a viral infectious disease of upper respiratory region.
- ii. It is also known as **nasopharyngitis**, acute viral rhinopharyngitis, acute coryza or a cold .
- iii. It is caused by a group of viruses known as Rhinoviruses and Coronaviruses.

Q.75 Enlist the signs and symptoms of common cold.

Ans: Signs and Symptoms are as follows:

- Cough , sore throat, running nose and fever.
- Nasal congestion, sneezing.
- Conjunctivitis (red eyes)
- Muscle rashes, fatigue, headache, shivering and loss of appetite.

Q.76 Write a note on prevention of common cold.

Ans: Prevention and Control is possible by following methods:

- Staying away from person suffering from common cold.
- Washing hands with soap and water.
- Use of handkerchief to cover the nose and mouth during coughing and sneezing.
- Alcohol based hand sanitizer can also be used.

#Q.77 What are the symptoms of common cold?

Ans: Common cold can be prevented by taking the following precautions:

- i. Cough, sore throat, running nose and fever.
- ii. Nasal congestion and sneezing.
- iii. Conjunctivitis (red eyes)
- iv. Muscle rashes, fatigue, headache, shivering and loss of appetite.

Ringworm (Dermatophytosis)

Q.78 What is Ringworm?

Ans:

- i. It is fungal infection of skin.
- ii. It is caused by many fungal species belonging to the genera *Trichophyton* and *Microsporum*.
- iii. These fungi feed on keratin in skin, hair and nails.

★Q.79 Give the name of the causative agent of ringworm?

Ans:

- i. It is caused by many fungal species belonging to the genera *Trichophyton* and *Microsporum*.

Q.80 Enlist the signs and symptoms of ring worm?

Ans: Signs and Symptoms of ring worm are as follows:

- Infected skin shows enlarged, red ring caused due to ringworm.
- Appearance of dry, scaly lesions on various parts of the body. These red patches cause intense itching.
- Infection to nails is termed as onychomycosis, in which nails become thick, discoloured and disfigured.
- Athlete’s foot is the fungal infection that usually begins between the toes.

Q.81 Can you tell?

Why do we suffer common cold repetively in our life, but other viral diseases like Influenza or Small pox only once?

Ans:

- i. Common cold is caused mainly by two groups of viruses called coronaviruses and rhinoviruses.
- ii. Each group contains numerous different types of viruses that can cause common cold. An individual may not always be infected by the same type of virus, hence it is difficult to develop immunity against

- the virus.
- iii. Also, since Rhinoviruses and Coronaviruses rapidly mutate and new viruses constantly develop, the body is unable to develop resistance against them.
 - iv. However, small pox is caused only by Variola virus and the body develops a memory during primary exposure or vaccination. Hence, it is unlikely that a person would suffer from a disease caused by the same pathogen during secondary exposure, due to resistance by the body's immune system.
 - v. Also, RNA viruses (like rhinoviruses) mutate faster than DNA viruses (like small pox).

Q.82 How can be ring worm diagnosed and treated?

Ans: Diagnosis is by physical examination and treatment uses drugs like nystatin, fluconazole, itraconazole, etc.

Q.83 How can you prevent ring worm?

Ans: Avoid close contact, sharing of clothes, sport equipments. Washing clothes in hot water with fungicidal soap help to destroy fungal pathogen.

I. Dengue

Q.84 Write a note explaining dengue.

- Ans:**
- i. Dengue fever is a painful, debilitating vector borne disease, caused by any one of four closely related dengue viruses.
 - ii. Dengue virus is transmitted through the bite of female Aedes mosquito.
 - iii. The mosquito takes up the dengue virus when it sucks blood of a person suffering from dengue.
 - iv. It can not spread directly from one person to another person.

#Q.85 Can you tell?

- i. Which are the diseases that can be avoided by eradication of mosquitoes in

your area?

Ans: Mosquitoes cause transmission of the following diseases like. Chikungunya, Zika virus, Dengue, West Nile Virus, Malaria, Japanese encephalities, etc.

Hence, eradication of Mosquitoes would prevent these diseases.

ii. What are the various ways in which mosquitoes can be eradicated from any area?

Ans: Eradication of mosquitoes has been proposed by certain researchers since it transmits some of the insert deadliest infections.

a. A 'specicide' of 30 mosquitoes has been proposed by introducing a genetic element which can insert itself into another crucial gene, essential for the survival of the mosquito.

b. Another study suggests a combination of 'bacteria induced incompatibility' and 'irradiation induced sterilisation'.

The male mosquitoes are first infected with an artificial version of the bacteria *Wolbachia* (Which hinders their ability to reproduce). The mosquitoes are then exposed to a dose of radiation as a precaution to ensure that any females present in the sample would also not be able to reproduce.

Once these males are introduced into the wild, the females they mate with cannot produce viable embryos thus effectively reducing the overall population of mosquitoes.

c. Sterile Insect technique : It involves rearing large quantities of sterilized male mosquitoes in facilities and then releasing them into the wild. The females they mate with do not produce any offspring, thus reducing the insect population over time.

d. Refer Q.45

iii. What precautions will you take if you are travelling in an area which has lot of mosquitoes?

Ans:

- a. Though most mosquito borne diseases do not have vaccinations, there are available vaccines against Japanese encephalitis and yellow fever. Thus, people travelling to areas with risk of those viruses should get vaccinated.
- b. Travelers should do a proper study regarding the place they intend to visit with respect to vector borne diseases.
- c. Pack a travel health kit with insect repellent.
- d. Prefer to pack and wear long sleeved shirts and long pants in order to prevent mosquito bites.
- e. The traveler should see a healthcare provider familiar with travel medicine, ideally 4 to 6 weeks before your trip.

Q.86 How does the transmission of each of following diseases take place?

- i. **Amoebiasis**
- ii. **Malaria**
- iii. **Ascariasis**
- iv. **Pneumonia**

Ans:

- i. Refer Q.47 ii.,iii.
- ii. Refer Q.43
- iii. Refer Q.53
- iv. Refer Q.70

Cancer

Q.87 Write a note on tumor.

Ans: Abnormal, uncontrolled and purposeless division of cells may lead to the formation/development of mass of undifferentiated cells i.e. tumor. When tumor is malignant, it is described as cancer and has ability to invade other tissues.

Q.88 What is neoplasm?

Ans: Cancer harms the body when cancerous cells divide uncontrollably to form new lumps or masses of tissue called neoplasm (except in the case of leukemia).

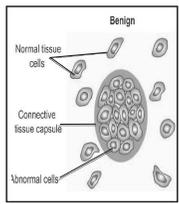
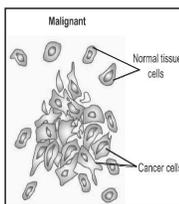
#Q.89 Give the symptoms of cancer.

Ans: Symptoms of cancer are as follows:

- i. Cancer symptoms are quite varied and depend on where the cancer is located, where it has spread, and the size of the tumour.
- ii. Some cancers can be felt or seen through the skin - a lump on the breast or testicle can be an indicator of cancer in those locations.
- iii. **Melanoma** (skin cancer) is often noted by a change in a wart or mole on the skin.
- iv. Some oral cancers present as white patches inside the mouth or white spots on the tongue.
- v. Metastasis of cancer can produce additional symptoms in the newly affected area, like swollen or enlarged lymph nodes.
- vi. Vertigo, headache, seizures may be experienced if cancer spreads to the brain.
- vii. In addition, liver may become enlarged and cause jaundice.
- viii. The bones become painful, brittle and break easily.
- ix. Coughing and shortness of breath may occur if lungs are affected due to cancer.

#Q.90 What is cancer? Differentiate between benign tumor and malignant tumor. Name the main five types of cancer.

Ans: An uncontrolled growth and multiplication of cells resulting into a harmful tumour is called cancer.

No.	Benign cancer	Malignant cancer
i.	It grows slowly	The growth rate of this tumour is rapid
ii.	Mortality rate is extremely low	Mortality rate is comparatively high.
iii.	These cells remain restricted to the site of origin and do not spread to other parts of the body.	These cells spread from one organ to another via blood or lymph by metastasis.
iv.	They may become malignant.	They form secondary cancerous.
v.	They are non-malignant/non-cancerous.	They are malignant/cancerous.
		

The five types of cancer are :

- i. Carcinoma
- ii. Sarcoma
- iii. Lymphoma
- iv. Leukemia
- v. Adenocarcinomas

Q.91 Enlist and explain the types of cancer.

Ans: There are five main types of cancers according to the type of tissue affected. Cancers are named according to the tissue from which they arise.

- i. **Carcinoma:**
 - a. Cancer that arise from epithelial tissue covering or lining the body organs is known as carcinoma.
 - b. It include breast cancer, lung cancer, cancer of stomach, skin cancer. etc.
- ii. **Sarcoma:**
 - a. Cancer that arises from connective tissue is called sarcoma.
 - b. It include bone tumors (osteosarcoma), muscle tumors (myosarcoma), cancer of cartilage (chondrosarcoma) and cancer of adipose tissue (liposarcoma).
- iii. **Lymphoma:**
 - a. Cancer that arises from lymphatic tissue, is called lymphoma.
 - b. It occurs in the lymphatic nodes, spleen and tissues of immune system.
- iv. **Leukemia:**
 - a. It is a type of blood cancer in which there is excessive formation of white blood cells (WBCs) or leucocytes in the bone marrow.
 - b. People suffering from leukemia have very high leucocyte count.
 - c. The blood contains millions of abnormal immature WBCs or leucocytes that are incapable of fighting infections.
 - d. There are various types of leukemia such as monocytic leukemia, lymphoblastic leukemia etc.
- v. **denocarcinoma:**
Adenocarcinoma cancer arises in thyroid,

pituitary adrenal and other glandular tissues.

#Q.92 Find out.

Collect information about different types of lymphoma and hereditary cancer syndromes.

Ans: Lymphomas are broadly classified into two types:

- i. **Non-Hodgkin Lymphoma:**
It spreads in an orderly manner from one group of lymph nodes to another. Non-Hodgkin lymphoma becomes more common as people get older.
- ii. **Hodgkin Lymphoma:**
It spreads through the lymphatic system in a non-orderly manner. Rates of Hodgkin lymphoma are highes among teens and young adults (ages 15 to 39 years) and again among older adults (ages 75 years or older)
Hereditary cancer syndrome:
It is a type of inherited disorder in which there is a higher-than-normal risk of certain types of cancer. Hereditary cancer syndromes (family cancer syndrome and inherited cancer syndrome) are caused by mutations (changes) in certain genes passed from parents to children.
In a hereditary caner, developing cancer at an early age, or having two or more types of cancer develop in the same person.
Examples of hereditary cancer syndromes are hereditary breast and ovarian cancer syndrome, Li-Fraumeni syndrome, Cowden syndrome, and Lynch syndrome.

Q.93 Write a note on causes of cancer.

Ans: Although, it is still not very clear as to how the cancer is caused, several factors are now known to be cancer- causing i.e. carcinogenic.

These factors are as follows.

- i. **Chemicals :**
 - a. Several chemicals are known to induce cancer.
 - b. These include nicotine, caffeine,

- products of combustion of coal and oil.
- c. Several polycyclic hydrocarbons, some sex hormone and steroids, if given or secreted in large amounts, may cause cancer.
- d. Breast cancer seems to have hormonal relationship. It is more commonly observed in women who avoid breast feeding.
- ii. **Radiation :**
- a. The x-rays, gamma-rays cosmic rays, ultra-violet rays etc. are carcinogenic.
- b. Incidence of skin cancer is higher in the people working in very sunny areas due to UV radiation in the sunlight.
- iii. **Viruses :**
- a. Viruses causing cancer have genes called viral oncogenes (v-onc genes).
- b. These viruses are also called oncogenic viruses. e.g. EBV(Epstein-barr virus), HPV (Human papiloma virus) etc.
- iv. **Oncogenes :**
Several genes called cellular oncogenes (c-onc genes) or proto-oncogenes have been identified in normal cells which when activated under certain condition could lead to oncogenic transformation of cells.
- v. **Addiction :**
- a. Different types addictions likes smoking, chewing of tobacco lead to cancer of mouth, lips and lungs.
- b. Alcohol consumption may result in cancer of oesophagus, stomach, intestine and liver.
- c. Drugs also cause cancer e.g. Marijuana, anaerobic steroids etc.

Q.94 Try this.

- i. **Find the Oncocenters nearby your area.**

Ans: Some oncocenters are as follows:

- a. Onco Life Cancer Centre, Satara
- b. B N D PmThese viruses are also called onco Cnter, Mumbai.
- c. Kolhapur Cancer Centre, Kolhapur

- d. HCG cancer centre, Mumbai
- e. Ruby Hall Cancer Centre, Pune
- ii. **Prepare a chart of types of cancer and their preventive measures.**

Ans:

	Types of cancer	Preventive measures
a.	Lung, oesophagus, larynx, mouth, throat, kidney, bladder, pancreas, stomach, cervix	Avoid smoking tobacco. Prevent exposure of second hand smoke. Avoid use of smokeless tobacco like chewing tobacco
b.	Oesophagus, colorectum, breast, endometrium and kidney	Dietary modifications. Consume diets high in vegetables and fruits. Carry out regular physical activities and maintain healthy body weight.
c.	Oral cavity, Pharynx, larynx, oesophagus, liver, colorectum and breast	Avoid consumption of alcohol
d.	Liver, Cervix	Vaccination of prevention of infections.
e.	Lung	Reduce exposure to environmental pollution of air.
f.	Lung, Mesothelioma, Bladder	Limit exposure to occupational carcinogens like asbestos.
g.	Skin, Basal cell carcinoma (BCC), Squamous cell carcinoma (SCC), Melanoma	Prevent exposure to radiations.

- *Q.95 What is a carcinogen? Name one chemical carcinogen with its target**

tissue.

Ans:

- i. Carcinogens are factors known to cause cancer.
- ii.

Carcinogen	Organ affected
1.Soot	Skin, lungs
2.Coal tar (3,4 benzopyrene)	Skin, lungs
3.Cigarette smoke (N-nitrosodimethlene)	Lungs
4.Cadmium oxide	Prostate gland
5.Aflatoxin (a metabolite of <i>Aspergillus flavus</i> , a mould)	Liver
6.2-naphthylamine and 4-aminobiphenyl	Urinary bladder
7.Mustard gas	Lungs
8.Nickel and chromium compounds	Lungs
9.Asbestos	Lungs
10. Diethylstilbestrol (DES)	Vagina
11. Vinylchloride (VC)	Liver

Q.96 Describe various treatments of cancer.

Ans: Treatment of Cancer:

Cancer treatment consists of combination of a number of therapies which are follows:

- i. **Chemotherapy:**
 - a. Chemotherapy comprises administration of certain anticancer drugs.
 - b. The anticancer drugs check cell division by inhibiting DNA synthesis or are more toxic to cancerous cell than to normal cells.
 - c. Chemotherapy may lead to hair loss or anaemia but both get corrected after the treatment is stopped.
- ii. **Radiotherapy:**
 - a. It is used in addition to chemotherapy.
 - b. In radiotherapy, the basic principle is to bombard the cancerous tissue or cells with the rays from radioactive

materials.

- c. For treatment, the cancer tissue or cells are exposed to radiations from radioactive materials such as cobalt, iridium and iodine.
- d. The rays x-rays gamma rays and charge particles are used to destroy the cancerous tissue or cells but cause minimum damage to the surrounding normal tissue or cells.

iii. **Surgery:**

- a. In surgery, the entire cancerous tissue or cells are removed surgically. It has limited utility.
- b. In certain cases such as breast tumor or uterine tumor, the surgery is most effective, but other treatments are also given to kill any cancerous cell that may have been escaped in surgery.

iv. **Immunotherapy:**

- a. Tumor cell have been shown to avoid detection and destruction by immune system.
- b. Therefore, the patients are given substances called biological response modifiers such as a-interferon which activates their immune system and helps in destroying the tumor.

v. **Supportive therapy:**

- a. Supportive therapy is used to treat symptoms of cancer and side effects of cancer treatments.
- b. Objective of this therapy is to improve the quality of life of cancer patient.
- c. This therapy varies depending upon condition of individual patient.

AIDS TEXTUAL

★Q.97 What does the abbreviation AIDS stand for?

Ans: The abbreviation of AIDS stands for Acquired Immuno Deficiency Syndrome.

Q.98 What is AIDS?

Ans:

- i. AIDS, the **acquired immuno deficiency**

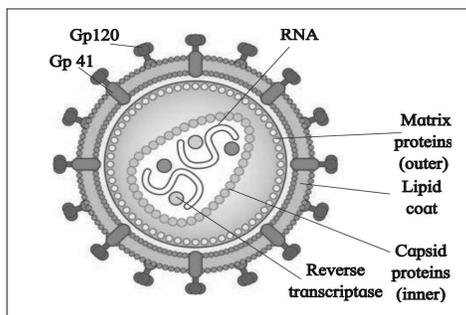
syndrome, is a usually fatal illness caused by a retrovirus (ss RNA) known as the **human immuno deficiency virus (HIV)** which weakens the body's immune system, leaving the victim vulnerable to life –threatening opportunistic infections, neurological disorders and unusual malignancies.

- ii. AIDS can be called a modern pandemic (world wide), affecting both industrialized and developing countries.
- iii. AIDS was first noticed in USA in 1981. In India, first confirmed case of AIDS was in April 1986 from Tamil Nadu.

Q.99 Explain the structure of HIV.

Ans:

- i. HIV is 100 to 140 nm in diameter. It is spherical.
- ii. Virus particle shows centrally located two ss RNA molecules along with reverse transcriptase enzymes.
- iii. It is covered by two layers of proteins.
- iv. The outer layer is of matrix protein (p17) while in inner layer is capsid protein (p24).
- v. Over the matrix protein layers there is an additional layer of lipids. Impregnated with glycoprotein GP120 and GP 41
- vi. The virus replicates in actively dividing T4 lymphocytes and can remain in a latent state/stage in the lymphoid cells. The virus has unique ability to destroy human T₄ lymphocytes.
- vii. HIV is found in greatest concentration in blood, semen and cerebrospinal fluid (CSF) and to lesser extent in tears, milk, urine, saliva, cervical and vaginal secretions.



Q.100 Write a note on transmission of AIDS.

Ans: The virus can be transmitted through :

- i. **Unsafe sexual contact:**
Including oral, vaginal and anal sex.
- ii. **Blood :**
Via blood transfusions or needle sharing.
- iii. **From mother to child (Transplacental):**
A pregnant woman can transmit the virus to her foetus through their shared blood circulation, or a nursing mother can transmit it to her baby from her breast milk.
- iv. Other methods of spreading of the virus are rare and include accidental needle injury, artificial insemination with infected donated semen and transplantation with infected organs.
- v. AIDS virus has been found in urine, tears, saliva, breast milk and vaginal secretions but it seems not to be transmitted by these fluids unless it gets into injuries.

Q.101 How is HIV infection not spread?

Ans: Causal contact such as hugging, insect bite (mosquitoes), participation in sports, touching items previously touched by a person infected with the virus, hand shake, sharing clothes, swimming pools etc.

Q.102 Write a note on clinical manifestations of HIV.

Ans: The clinical manifestations (symptoms) of AIDS have been classified into four broad categories.

- i. Initial infection with the virus and formation of antibodies, usually 2-8 weeks after initial infection.
- ii. Asymptomatic carrier state in which no signs of disease, are seen. Incubation period ranges for 6 months to 10 years.
- iii. AIDS related complex (ARC) with one or more of the following clinical signs: recurrent fever for longer than one month, fatigue, unexplained diarrhea, night sweats, shortness of breath, loss of more than 10 per cent body weight, etc.
- iv. AIDS is the end stage of HIV infection. It is characterised by life threatening

opportunistic infections (like pneumonia, tuberculosis, kaposi sarcoma, etc.).

Q.103 What are the preventive measures against AIDS?

Ans: Preventive measures:

AIDS has no cure, hence prevention is the best choice. The following steps help in preventing this dreadful disease

- i. People, particularly those in high –risk group, should be educated about HIV transmission.
- ii. Disposable needles and syringes should be used and disposed off properly and immediately.
- iii. Sexual habits should be changed immediately.
- iv. High-risk groups should refrain from donating blood.
- v. Tooth brushes, razors, other articles that can become contaminated with blood should not be shared.
- vi. Before receiving blood, ensure that it has been screened for not containing HIV infections.
- vii. Routine screening must be done for –
 - a. Blood donors.
 - b. Organ donors (kidney, liver, lung, cornea).
 - c. Donors of semen and growth hormone.
 - d. Patients undergoing hemodialysis and females in high risk group who are pregnant or contemplating pregnancy.

Q.104 Explain the diagnosis of HIV.

Ans:

- i. At first a test is used to detect the HIV antibodies, while a second confirmatory test is used to weed out any false positive results. The first test is **ELISA** (Enzyme-Linked Immunosorbent Assay).
- ii. The confirmatory test, usually a Western Blot, is a highly specific test.
- iii. It is based on detecting specific antibody to viral core protein and envelope glycoprotein.

Q.105 What is the treatment of AIDS.

Ans: Although AIDS has no cure, certain medicines called as Antiretroviral drugs can help in reducing the viral load and prolong the life of HIV patient. Examples of these drugs used in Antiretroviral therapy (ART) are TDF (tenofovir), EFV(Efavirenz), Lamivudine (3TC), etc.

***Q.106 Write a short note on AIDS.**

Ans: Refer Q.100, 102(iv), Q.103, Q.104, Q.105.

***Q.107 Match the following.**

	Column I		Column II
a.	AIDS	i.	Antibody production.
b.	Lysozyme	ii.	Activation of B-cells
c.	B-cells	iii.	Immunoglobulin
d.	T-helper cells	iv.	Tears
e.	Antibody	v.	Immunodeficiency

Ans: a-v, b-iv, c-i, d-ii, e-iii.

10.4 Adolescence

Q.108 Define adolescence.

Ans: Adolescence is the period of beginning with the appearance of secondary sexual characters and the termination with ceassation of somatic i.e. body growth.

Q.109 Write a short note on adolescence.

Ans:

- i. Adolescence is the period of beginning with the appearance of secondary sexual characters and the termination with ceassation of somatic i.e. body growth.
- ii. It can also be regarded as a transitional stage of physical and mental development of child occurring between puberty and the legal adulthood between 10 to 19 years of age where individual is no longer a child but not yet an adult.
- iii. Adolescence in fact is a phase rather than fixed time period in the life.
- iv. It is a phase of development on many

fronts like sexual and reproductive maturity, mental development, adult identity and transition from socio economic and emotional dependant to relative independence.

Q.110 Activity

Prepare chart of different stages of adolescence mentioining the changes in growth, sexual development and emotional and social changes.

Ans: Refer Q.111

Sr. No	Stages of adolescence	Age	Change in growth, sexual development, emotional and social changes
i.	Early period	10 to 14 years	The changes include beginning of the appearance of secondary sexual characters; growth; concrete thinking; defining boundaries of dependence/independence; self exploration; developing body image; development of intese friendship; seeking to counter instability and evaluation.
ii.	Middle period	15 to 17 years	It is characterized by almost complete full development of secondary sexual characteristic; growth slow down, approximately 95% of the adult stature is attained; thinking is more abstract; concrete thinking under stressful condition; reestablishing of body image capable of long range thinking; sense of leadership and all powerfulness; preoccupied with romantic fantasy; ability testing to attract opposite sex, peer group help defining behavioral code etc.
iii.	Late period	18 to 19 years	It is characterized by establishment of total physical maturity estalished abstract thinking, intellectual and fuctional indentity; peer group recedes in favour of individual relationship, stable relationship and change from childhood to adulthood relationship.

Q.111 What are do physical changes of adolescence?

Ans:

i. Growth spurt:

- It occurs in both boys and girls.
- In boys muscles develop, skin become oily, broadening of shoulders cracking of voice, development of underarm and chest hair, pubic hair, facial hair, enlargement of penis and testis.
- In girls development of breast, widening of hip, development of underarm and pubic hair, enlargement of uterus and ovaries.

ii. Sexual development :

Sex organs mature and enlarge, sexual desire, errection of penis in boys, sperm production, ejaculation, ovulation, menstruation and initiation of sexual behaviour.

iii. Emotional and social changes :

- This include establishing own identity, fantasy, day dreaming, attention seeking behavior, emotional instability full of energy, sexual attraction.
- Rapid mood changes conflicts with family, behavioural code (influence by peer group) self exploration and evaluation, formation of new relationship, peer pressure etc.

Q.112 What are the affects of adolescence on mental health.

Ans:

- i. Many of the emotional and social changes have implication on the mental health.
- ii. Most of the mental health issues that people confront as adults begin to appear in adolescence .
- iii. The mental health implication includes confusion irritation, moodiness, frustration, nausea, less concentration, hyper activities, anger, effects on life styles like obesity, addictions, accidents, leading to ill health etc.
- iv. The mental illness in fact is in terms of different forms of depression like insomnia and loss of energy.
- v. Thus, mental illness (disorders or unfavourable changes) is associated with psychological or behaviour manifestation. These are broadly classified as either psychoses or neuroses.
- vi. Psychoses include delusions, hallucinations, disturbance in the thinking process, etc.
- vii. The psychoses lead to Alzheimer’s disease schizophrenia, depressive psychosis, etc. Amnesia (loss of memory) Bullimia (extreme over indulgence in food) Anxiety (fear or apprehension) Anorexia nervosa (emotional aversion to food) depression (sadness, inactivity reduced to enjoy life, etc.)
- viii. Neuroses include schizophrenia, illusions, hallucination, etc.
- ix. Adolescence is thus characterized by number of cognitive, emotional, behavioural, physical and attitudinal changes which may lead to positive personality development depending upon the relation with parents or to other conditions, to conflicts to others side.
- x. In fact they view their friends peer group more important and influential than their parents.
- xi. This may lead to various kinds of addictions like smoking, taking drugs, etc.

Q.113 What could be the treatment for mental

health disorders during adolescence.

Ans: Treatment of such disorders should be preferentially with non-pharmacological approach with due respect to rights of children. WHO has recommended evidence based guidelines under mental health Gap Action Programme (mhGAP).

10.5 Addiction

Q.114 What do you mean by addiction?

Ans:

- i. Addiction is a complex condition characterised by compulsive use of substance despite of its harmful consequences.
- ii. Addiction may involve the use of substances (drugs) such as alcohol, opioids, cocaine, nicotine and others or behaviours such as gambling.

Q.115 What are the causes of substance abuse during Adolescence?

Ans: Causes of substances abuse during Adolescence

- i. Insufficient parental supervision and monitoring.
- ii. Lack of communication between child and parents.
- iii. Poorly defined rules.
- iv. Family conflicts.
- v. Favorable parental attitudes towards alcohol and drug uses.
- vi. Expectations from drugs use.
- vii. Risk taking behavior.

Q.116 What are the measures to control drug abuse.

Ans: Methods /measures to control drug abuse during Adolescence are as follows :-

- i. Always remember ‘Prevention is better than cure’.
- ii. Avoid undue pressure – A child should not be forced to perform beyond his /her capacities in studies, sports and other activities.
- iii. Education and Counselling of child to face problems and stress, to accept

disappointments and failures as a part of life. Channelize the energy of child in sports, studies and other constructive activities.

10.6 Drug Abuse

Q.117 Enlist the commonly abuse drugs and write a short note on them.

Ans: The drugs, which are commonly abused, are opioids, cannabinoids and alkaloids of coca.

i. **Opioids :**

- These drugs binds to opioid receptors present in central nervous system and gastro intestinal tract.
- Heroin**, otherwise called smack is chemically di-acetyl morphine. It is extracted from latex of poppy plant ***Papaver somniferum***.
- Heroin is depressent and slows down the activity of body.

ii. **Cannabinoids :**

- Interact with receptors present in brain. Inhalation and ingestion of these substances affect the cardiovascular system.
- These are obtained from inflorescences and the parts of *Cannabis sativa*. Marijuana, hashish, charas and ganja are other different forms of drugs obtained from this plant.

iii. **Cocain :**

- This is an alkaloid obtained from coca plant- *Erythroxyllum coca*.
- It increases level of neurotransmitter-dopamine.
- Its excessive dosage causes extreme happiness, irritability, paranoia.
- Hallucinogens** (mind expanding drugs) : These are alkaloids causing day-dreaming. Lycergic acid and cannabis are hallucinogenic substances. Atropa bellodona and Datura spp. also have hallucinogenic properterties. Hallucination are unreal perceptions of unreal object due to the

disorder of nervous system.

Q.118 What is the source of cocaine?

Ans: Cocaine is an alkaloid obained from coca plant - *Erythroxyllum coca*.

Q.119 Activity.

Identify the name of the plant. Enlist different types of drugs derived/ obtained from the same.



Ans: Opium popy.

For drug derived/ obtained from poppy plant: Refer Q.117(i)

Q.120 Write a note on addiction.

Ans:

- Addiction is a psychological attachment to certain effects—such as euphoria and a temporary feeling of well-being – associated with drugs and alcohol.
- These drive people to take them even when these are not needed, or even when their use becomes self-destructive.
- With repeated use of drugs, the tolerance level of the receptors present in our body increases.
- Consequently the receptors respond only to higher doses of drugs or alcohol leading to greater intake and addiction.

Q.121 What is meant by dependence?

Ans:

- Dependence is the tendency of the body to manifest a characteristic and unpleasant **withdrawal syndrome** if regular dose of drugs/ alcohol is abruptly discontinued.

- ii. This is characterized by anxiety, trembling, nausea and sweating, which may be relieved when use is resumed.

★Q.122 Describe the ill effects of alcoholism on health.

Ans:

- i. The immediate adverse effects of drugs and alcohol abuse are manifested in the form of reckless behaviour, vandalism and violence.
- ii. Excessive doses of drugs may lead to coma and death due to respiratory failure, heart failure or cerebral hemorrhage. A combination of drugs or their intake along with alcohol generally results in overdose and even deaths.
- iii. The most common **warning signs** of drug and alcohol abuse among youth include drop in academic performance, unexplained absence from school/college, lack of interest in personal hygiene, withdrawal, isolation, depression, fatigue, aggressive and rebellious behaviour, deteriorating relationships with family and friends, loss of interest in hobbies, change in sleeping and eating habits, fluctuations in weight, appetite, etc.
- iv. There may even be some far-reaching implications of drug/alcohol abuse. If an abuser is unable to get money to buy drugs/alcohol he/she may turn to crime. At times, a drug/alcohol addict becomes the cause of mental and financial distress to his/her entire family and friends.
- v. Those who take drugs intravenously (direct injection into the vein using a needle and syringe) are likely to acquire serious infections like HIV and hepatitis B. Use of alcohol during adolescence may also have long-term effects like loss balance, liver cirrhosis, pancreatitis. It could lead to heavy drinking in adulthood.
- vi. Chronic use of drugs and alcohol damages nervous system and liver (**cirrhosis**). Use of drugs and alcohol during pregnancy adversely affects the foetus.

- vii. Another misuse of drugs is that certain sports persons use drugs to **enhance performance**. They (mis)use narcotic analgesics, anabolic steroids, diuretics and certain hormones to increase muscle strength and bulk and to promote aggressiveness and overall improvement in their performance.
- viii. Side-effects of the use of **anabolic steroids** in females include masculinization (features like males), increased aggressiveness, mood swings, depression, abnormal menstrual cycles, excessive hair growth on the face and body, enlargement of clitoris, deepening of voice.
- iv. In males it includes acne, increased aggressiveness, mood swings, depression, and reduction of size of the testicles, decreased sperm production, kidney and liver dysfunction, breast enlargement, premature baldness, enlargement of the prostate gland. These effects may be permanent with prolonged use.

Q.123 Write a note on prevention of addiction.

Ans:

- i. The age-old adage (i.e. proverb) is 'prevention is better than cure' holds true for all addictions. It is also true that habits such as smoking, taking drug or alcohol are more likely to be taken up at a young age, more during adolescence.
- ii. It is best to identify the situations that push an adolescent towards use of drugs or alcohol, and to take remedial measures well in time.
- iii. **In this regard, the parents and the teachers have a special responsibility.**

Q.124 In your view, what motivates the youngsters to take to alchoho or drugs and how can this be avided?

Ans: Refer Q.120 and Q.123

Q.125 Name the addicting component found in tobacco.

Ans: Nicotine is the addicting component found in tobacco.

Q.126 Use your brain power.

Deaddiction may be difficult but not impossible. Collect information about NGOs, working in the field of deddiction.

Ans:

- i. Apha healing center, Gujarat.
- ii. Zorbacare, Pune.
- iii. Sona Drug Awareness De-addiction and Rehabilitation centre, Sangli.
- iv. Arise and Shine Foundation, Titwala.
- v. Jagruti Rehab, Navi mumbai.

Q.127 Name one disease caused by smoking?

Ans: Cancer of mouth, lips and lungs.

#Q.128 Why is smoking a bad habit?

Ans:

- i. Smoking tobacco is the greatest risk factor for cancer mortality.
- ii. Tobacco smoke has more than 7000 chemicals and atleast 250 are known to be harmful and more than 50 of them are known to cause cancer.
- iii. Tobacco smoking causes many types of cancer, including cancers of the lung, oesophagus, arynx (voice box), mouth, throat, kidney, bladder, pancreas, stomach and cervix.
Hence, for all these reasons smoking is considered as a bad habit.

#Q.129 Do you think that friends can influence one to take alcohol/drugs? If yes, how may one protect himself/herself from such an influence?

Ans: Yes, friends can influneece one to take alcohol/drugs.

One can protect oneself from such an influence by the following ways:

- i. **Counselling:**
Seek counselling to deal with mental illness or traumas experienced. One can also attend support groups, read self-help

books and seek advice from a therapist. There are many specific national helpline numbers that can also offer help.

ii. **Support:**

Share your fears and problems with a reliable person like a teacher or a parent who can support you and help you. This will make it easier to avoid stress and the desire to adopt an addiction.

iii. **Choose friends carefully:**

Peer pressure is one of the main causes of addictions amongst teenagers. Hence it is best to avoid people who you know are addicted. Carefully choose your friend circle and who you decide to confide in.

iv. **Avoid starting young:**

Those who start drinking or using drugs are an early age (even in small amounts) are most likely to develop and addiction later in life.

v. **Be aware of the consequences of addicitons:**

Stay aware about the effect of drug and alcohol adiction on your social, physical and mental health and prevent adverse impact on yourself by refraining from it.

vi. **Develop strong bonds:**

Social connections can help protect you against the risk of substance use.

vii. **Participate in anti-drug, tobacco and alcohol programs:**

Early interventions can help a person, If you have adopted a bad habit, or feel you are on the path of addiction, admit the problem and seek timely help to prevent it from truning into an addiction.

Q.130 Collect information about the, symptoms and preventive measure, treatments for Dengue, Swine flu and Tuberculosis (TB).

Ans:

	Disease	Symptoms	Treatments	Preventive Measures
i.	Dengue	Mild symptoms include fever, aches and pains, or rash. Most common symptom of dengue is fever with any of the following: eye pain, headache, muscle pain, rash, bone pain, nausea/vomiting, joint pain	There is no specific medication to treat dengue.	Avoid mosquito bites. A dengue vaccine is available for use in some parts of the world, including United States territories.
ii.	Swine flu	A fever or feeling feverish/chills. Cough, Sore throat, Runny or stuffy nose, Muscle or body aches, headaches, Fatigue	Oseltamivir and zanamivir	Vaccines to protect against 2009 H1N1 are widely available. Wash your hands with soap and water. Use alcohol-based hand cleaners. Avoid close contact with sick people.
iii.	Tuberculosis	TB bacteria most commonly grow in the lungs, and can cause symptoms such as: A bad cough that lasts 3 weeks or longer pain in the chest, Coughing up blood or sputum, weakness or fatigue, Weight loss, No appetite, Chills, Fever, Sweating at night.	It is very important to take the complete dose of medicines. The first-line anti-TB drugs are: Isoniazid, rifampin, ethambutol and pyrazinamide.	Good ventilation. Natural light, Good hygiene, BCG vaccine.