



HUMAN HEALTH AND DISEASES

CHAPTER SNAPSHOT

- 7.01 Common diseases in human beings: Infectious and non infectious diseases
- 7.02 Maintenance of personal and public hygiene
- 7.03 Adolescence – Drug and alcohol abuse
- 7.04 Mental health – Depression
- 7.05 Lifestyle disorders in human beings

MUST KNOW DEFINITIONS

Communicable diseases	:	Diseases which are transmitted from one person to another are called infectious diseases or communicable diseases .
Non infectious diseases	:	Diseases are not transmitted from infected to a healthy person.
Vector	:	An insect (organism which carries the pathogen from infected person/things to a healthy person.
Pandemic	:	A disease which has spread worldwide.
Digenic parasite	:	An organism which requires two hosts to complete its life cycle
Hygiene	:	Set of practices performed to conserve good health
Drug abuse	:	The intake of drugs in an amount and frequency that impairs one's physical, Physiological and Psychological functions.
Euphoria	:	A state characterised by mental and emotional preoccupation with the drug by the person.
Alcoholism	:	Initially to control drinking due to physical and emotional dependence on alcohol
Addiction	:	Physical or Psychological need to do or take or use certain substance to the point that it can be harmful to the individual.
Korsakoff syndrome	:	Chronic memory disorder caused by alcohol misuse.
Zoonotic	:	An organism transmitted from animals to humans



Evaluation

- A 30 year old woman has bloody diarrhoea for the past 14 hours, which one of the following organisms is likely to cause this illness?

(a) *Streptococcus pyogens*
 (b) *Clostridium difficile*
 (c) *Shigella dysenteriae*
 (d) *Salmonella enteritidis*

[Ans. (c) *Shigella dysenteriae*]
- Exo-erythrocytic schizogony of *Plasmodium* takes place in _____

(a) RBC (b) Leucocytes
 (c) Stomach (d) Liver

[Ans. (d) Liver]
- The sporozoites of *Plasmodium vivax* are formed from _____

(a) Gametocytes (b) Sporoblasts
 (c) Oocysts (d) Spores

[Ans. (c) Oocysts]
- Amphetamines are stimulants of the CNS, whereas barbiturates are _____.

(a) CNS stimulant (b) both a and b
 (c) hallucinogenic (d) CNS depressants

[Ans. (d) CNS depressants]
- Choose the correctly match pair.

(a) Amphetamines - Stimulant
 (b) LSD - Narcotic
 (c) Heroin - Psychotropic
 (d) Benzodiazepine - Pain killer

[Ans. (a) Amphetamines - Stimulant]
- The Athlete's foot disease in human is caused by _____

(a) Bacteria (b) Fungi
 (c) Virus (d) Protozoan

[Ans. (b) Fungi]
- Cirrhosis of liver is caused by chronic intake of _____

(a) Opium (b) Alcohol
 (c) Tobacco (d) Cocaine

[Ans. (b) Alcohol]
- The sporozoite of the malarial parasite is present in _____.

(a) saliva of infected female *Anopheles* mosquito
 (b) RBC of human suffering from malaria
 (c) Spleen of infected humans
 (d) Gut of female *Anopheles* mosquito

[Ans. (a) saliva of infected female *Anopheles* mosquito]
- Where do the following events in the life cycle of *Plasmodium* takes place?

Ans. (a) Fertilization - **Mosquito's gut**
 (b) Development of gametocytes - **Red blood cells of human**
 (c) Release of sporozoites - **Blood stream of human**
 (d) Schizogony - **liver of human**
- Paratope is an _____

(a) Antibody binding site on variable regions
 (b) Antibody binding site on heavy regions
 (c) Antigen binding site on variable regions
 (d) Antigen binding site on heavy regions

[Ans. (c) Antigen binding site on variable regions]
- Allergy involves _____

(a) IgE (b) IgG
 (c) IgA (d) IgM

[Ans. (a) IgE]
- Spread of cancerous cells to distant sites termed as _____

(a) Metastasis
 (b) Oncogenes
 (c) Proto-oncogenes
 (d) Malignant neoplasm

[Ans. (a) Metastasis]
- AIDS virus has _____

(a) Single stranded RNA
 (b) Double stranded RNA
 (c) Single stranded DNA
 (d) Double stranded DNA

[Ans. (A) Single stranded RNA]
- B cells that produce and release large amounts of antibody are called _____

(a) Memory cells (b) Basophils
 (c) Plasma cells (d) killer cells

[Ans. (C) Plasma cells]



15. Given below are some human organs. Identify one primary and one secondary lymphoid organ. Explain its role. **Liver, thymus, stomach, thyroid, tonsils**

Ans. (i) Primary lymphoid organ: Thymus is a primary lymphoid organ.

Function: One of its main secretions is the hormone **thymosin**. It stimulates the T cell to become mature and **immunocompetent**. By the early teens, the thymus begins to atrophy and is replaced by adipose tissue

(ii) Secondary lymphoid organ: Tonsils is a secondary lymphoid organ.

The tonsils are part of the lymphatic system, which help to fight infections. They stop invading germs including bacteria and viruses.

16. Name and explain the type of barriers which involve macrophages.

Ans. (i) The type of barrier that involves macrophages are the phagocytic barriers which is a type of innate immunity.

(ii) In this mechanism, specialised cells such as monocytes, neutrophils and tissue macrophages phagocytose and digest whole microorganisms.

17. What are interferons? Mention their role.

Ans. Interferons are a group of signalling produced by virus infected cells. They interfere with viral replication and hence named interferons. A virus infected cell released interferons induce antiviral state in the uninfected cells. They are chemical mediators under physiological barriers offering innate immunity.

18. List out chemical alarm signals produced during inflammation.

Ans. Inflammatory barriers is a type of innate immunity. Tissue damage and infection induce leakage of vascular fluid, containing chemotactic signals like serotonin, histamine and prostaglandins. They influx the phagocytic cells into the affected area. This phenomenon is called diapedesis.

19. Explain the process of replication of retrovirus after it gains entry into the human body.

Ans. (i) After getting into the body of the person, the virus enters into macrophages where **RNA genome** of the virus replicates to form **viral DNA** with the help of the enzyme **reverse transcriptase**.

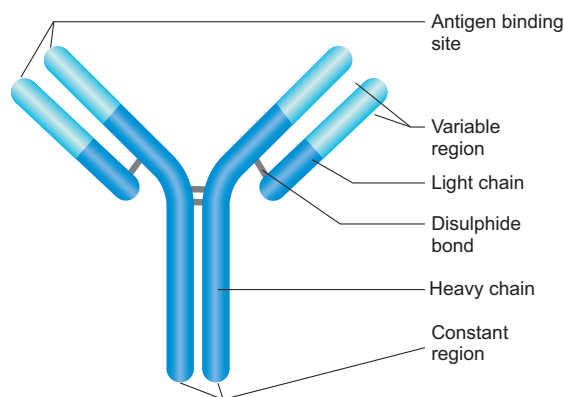
(ii) This viral DNA gets incorporated into the DNA of host cells and directs the infected cells to produce viral particles.

(iii) The macrophages continue to produce virus and in this way acts like a HIV factory.

(iv) Simultaneously, HIV enters into helper T-lymphocytes, replicates and produces progeny viruses. The progeny viruses released in the blood attack other helper T-lymphocytes.

(v) During this period, the person suffers from bouts of fever, diarrhoea and weight loss. Due to decrease in the number of helper T lymphocytes, the person starts suffering from infections and becomes immune deficient and unable to protect against any infection.

20. Explain the structure of immunoglobulin with suitable diagram.



Structure of immunoglobulin

(i) In the 1950s, experiments by **Porter and Edelman** revealed the basic structure of the immunoglobulin.

(ii) An antibody molecule is Y shaped structure that comprises of four polypeptide chains, two identical light chains (L) of molecular weight 25,000 Da (approximately 214 amino acids) and two identical heavy



chains (H) of molecular weight 50,000 Da (approximately 450 amino acids).

- (iii) The polypeptide chains are linked together by di-sulphide (S-S) bonds. One light chain is attached to each heavy chain and two heavy chains are attached to each other to form a Y shaped structure. Hence, an antibody is represented by $H_2 L_2$.
- (iv) Each chain (L and H) has two terminals. They are C - terminal (Carboxyl) and amino or N-terminal.
- (v) Each chain (L and H) has two regions. They have variable (V) region at one end and a much larger constant (C) region at the other end.
- (vi) Antibodies responding to different antigens have very different (V) regions but their (C) regions are the same in all antibodies.
- (vii) In each arm of the monomer antibody, the (V) regions of the heavy and light chains combines to form an antigen - binding site shaped to 'fit' a specific antigenic determinant. Consequently each antibody monomer has two such antigen - binding regions.
- (viii) The (C) regions that forms the stem of the antibody monomer determine the antibody class and serve common functions in all antibodies.

21. What are the cells involved innate immune system?

Ans. Monocytes, neutrophils, tissue, macrophages and phagocytes.

22. What is vaccine? What are its types?

Ans. A vaccine is a **biological preparation that provides active acquired immunity** to a particular disease and resembles a disease-causing microorganism and is often made from weakened or attenuated or killed forms of the microbes, their toxins, or one of its surface proteins. The vaccines are classified as first, second and third generation vaccines.

23. A person is infected by HIV. How will you diagnose for AIDS?

Ans. A simple blood test is available that can determine whether the person has been infected with HIV. The **ELISA** test (Enzyme Linked ImmunoSorbent Assay) detects the presence of HIV antibodies. It is a preliminary test. **Western blot** test is more reliable and a confirmatory test. It detects the viral core proteins. If both tests detect the presence of the antibodies, the person is considered to be HIV positive.

24. Autoimmunity is a misdirected immune response. Justify.

Ans. Autoimmunity is due to an abnormal immune response in which the immune system fails to properly distinguish between self and non-self and attacks its own body. Our body produces antibodies (**auto antibodies**) and **cytotoxic T cells** that destroy our own tissues. If a disease-state results, it is referred to as auto-immune disease. Thus, autoimmunity is a misdirected immune response. Autoimmunity is evidenced by the presence of **auto antibodies and T cells** that are reactive with host antigens. When the cells act as antigens in the same body, they are called autoantigens.

25. List the causative agent, mode of transmission and symptoms for Diphtheria and Typhoid.

Ans. (i) For Diphtheria:

Causal agent: *Corynebacterium diphtheriae*

Mode of Transmission: Droplet infection

Symptoms: Fever, sore throat, hoarseness and difficulty in breathing

(ii) For Typhoid:

Causal agent: *Salmonella typhi*

Mode of Transmission: Through contaminated food and water

Symptoms: Headache, abdominal discomfort, fever and diarrhoea.

26. A patient was hospitalized with fever and chills. Merozoites were observed in her blood. What is your diagnosis?

Ans. Occurrence of Merozoites in the blood indicates that the person is suffering from Malaria, Shivering, chills are the other symptoms of the disease.



27. (i) Write the scientific name of the filarial worm that causes filariasis.

(ii) Write the symptoms of filariasis.

(iii) How is this disease transmitted?

Ans. (i) Scientific name of Filarial Worm that causes filariasis is "*Wuchereria bancrofti*".

(ii) The accumulation of the worms in lymph glands block the lymphatic system resulting in inflammation of the lymph nodes. In some cases, the obstruction of lymph vessels causes elephantiasis or filariasis of the limbs, scrotum and mammary glands.

(iii) The disease is transmitted by female *Culex* mosquito, when the mosquito bites an infected person and then bites a healthy person.

28. List the common withdrawal symptoms of drugs and alcohol abuse.

Ans. The withdrawal symptoms may range from

- Mild tremors to convulsions,
- Severe agitation and fits,
- Depressed mood, anxiety, nervousness, restlessness, irritability,
- Insomnia,
- Dryness of throat, etc, depending on the type of drug abuse.

29. Why do you think it is not possible to produce vaccine against 'common cold'?

Ans. Cold is caused by a group of viruses called Rhino viruses. There are about 160 strains of these viruses. It is difficult to produce a vaccine which can act against so many strains of viruses. Therefore it is difficult to produce a vaccine for cold.



ZOOLOGY LONG VERSION QUESTIONS (FOR PURE SCIENCE GROUP)

LONG VERSION EVALUATION

1. Malaria caused by *Plasmodium* is transmitted through _____.

- Air
- Contact
- Fleas on food
- Mosquito bites

[Ans. (d) Mosquito bites]

2. Refer Evaluation Q.No.1

3. Which of the following disease is spread through droplet nuclei?

- Tularemia
- Listeriosis
- Chicken pox
- Mumps

[Ans. (c) Chicken pox]

4. Refer Evaluation Q.No.2

5. Refer Evaluation Q.No.3

6. *Poliomyelitis* which causes infantile paralysis enters the body through _____.

- Skin
- Mouth and nose'
- Ears
- Eyes

[Ans. (d) Eyes]

7. Refer Evaluation Q.No.4

8. Marijuana is extracted from

- Dried leaves and flowers of hemp plant
- Ergot fungus
- Roots of hemp plant
- Cocoa plant

[Ans. (a) Dried leaves and flowers of hemp plant]

9. Refer Evaluation Q.No.5

10. Refer Evaluation Q.No.6

11. Refer Evaluation Q.No.7

12. Refer Evaluation Q.No.8

13. Haemozoin is

- A precursor of haemoglobin
- A toxin from *Streptococcus*
- A toxin from *Plasmodium* species
- A toxin from *Haemophilus* species

[Ans. (c) A toxin from *Plasmodium* species]

14. The drug synthesised from *Datura* is

- Hallucinogen
- Depressant
- Stimulant
- Pain killer

[Ans. (a) Hallucinogen]

15. Refer Evaluation Q.No.9

24. What is Kala-azar?

- Ans. (i)** Kala – azar or visceral leishmaniasis is a protozoan disease caused by *Leishmania donovani*,
(ii) It is transmitted by the vector *Phlebotomus* (sand fly).

(iii) Infection may occur in the endothelial cells, bone marrow, liver, lymph glands and blood vessels of the spleen.

(iv) Symptoms of Kala azar are weight loss, anaemia, fever, enlargement of spleen and liver.

25. Refer Evaluation Q.No.29

Additional Questions

CHOOSE THE CORRECT ANSWER 1 Mark

I. CHOOSE THE CORRECT OPTIONS FOR THE BELOW QUESTIONS

1. _____ is a non infective disease.

- (a) Cold (b) Arthritis
(c) Chickenpox (d) Shigellosis

[Ans. (b) Arthritis]

2. Rigidity of the Jaw muscle is a symptom of ____.

- (a) Typhoid (b) Kala azar
(c) Tetanus (d) Chikungunya

[Ans. (c) Tetanus]

3. The site of infection for yersinia pestis is ____.

- (a) Intestine (b) Lungs
(c) Lymph nodes (d) Nervous system

[Ans. (c) Lymph nodes]

4. Choose the symptom applicable for mumps.

- (a) Muscular stiffness
(b) Enlargement of parotid gland
(c) Flu like illness
(d) Respiratory failure

[Ans. (b) Enlargement of parotid gland]

5. _____ is a pandemic disease.

- (a) Polio (b) Swine flu
(c) Dysentery (d) Dengue fever

[Ans. (b) Swine flu]

6. _____ is a carrier for transmitting entamoeba.

- (a) House fly (b) Mosquito
(c) Sand fly (d) Tsetse fly

[Ans. (a) House fly]

7. Yellowish eyes is a symptom of ____.

- (a) Plague (b) Measles
(c) Hepatitis (d) Sleeping sickness

[Ans. (c) Hepatitis]

8. Vector control research Centre is located in ____.

- (a) Chennai (b) Delhi
(c) Puducherry (d) Hyderabad

[Ans. (c) Puducherry]

9. _____ is a dermatropic disease.

- (a) Influenza (b) Measles
(c) Cold (d) Rabies

[Ans. (b) Measles]

10. _____ can be confirmed by widal test.

- (a) Tuberculosis (b) Cholera
(c) Typhoid (d) Hepatitis

[Ans. (c) Typhoid]

11. _____ is not a symptom of Kala-azar.

- (a) Anemia (b) Fever
(c) Spleen enlargement (d) Muscle spasms

[Ans. (d) Muscle spasms]

12. Cycles of fever in malaria is caused during ____.

- (a) Production of gametes
(b) Lysis of RBC
(c) Release of sporozoites
(d) Sporogony

[Ans. (b) Lysis of RBC]

13. Disease eradicated by immunization programmes in India.

- (a) Chicken pox (b) Small pox
(c) Measles (d) Diphtheria

[Ans. (b) Small pox]

14. Identify the rat flea vector

- (a) Xersinia (b) Tsetse fly
(c) *Xenopsylla cheopis* (d) *Musca*

[Ans. (c) *Xenopsylla cheopis*]



4. (a) Kala azar
(b) Malaria
(c) Swine flu
(d) African Sleeping sickness

[Ans. (c) Swine flu]

Reason: It is a viral disease whereas the others are protozoan diseases.

ANSWER IN ONE WORD*

- Viruses which cause common cold _____.
[Ans. Rhino viruses]
- Diseases which spreads by droplet infection _____.
[Ans. Diphtheria / Pneumonia/ Tuberculosis Poliomyelitis/ Cold/ Mumps/ Measles/ Chicken pox]
- Virus which causes measles _____.
[Ans. Rubella virus]
- Disease caused by Flavi virus _____.
[Ans. Dengue fever]
- Another name for dengue fever _____.
[Ans. break bone fever]
- Causal organism of chikungunya _____.
[Ans. Alpha virus (or) Toga virus]
- Name the vector for dengue fever _____.
[Ans. mosquito – Aedes aegypti]
- Causal organism of chicken pox _____.
[Ans. varicella – Zoster virus]
- Name a zoonotic virus _____.
[Ans. Nipah virus]
- Transmitting agent for causal organism of African sleeping sickness _____.
[Ans. Tsetse fly]
- Infective stage of *Entamoeba histolytica* _____.
[Ans. Trophozoite]
- Infective form of plasmodium present in saliva of mosquito _____.
[Ans. Sporozoite]
- A sexual reproduction undergone by plasmodium in the liver _____.
[Ans. Schizogony]

* Only for quick revision not in pattern

- Granules seen is schizont of plasmodium _____.
[Ans. shuffners granules]
- Reduction division seen is zygote of plasmodium _____.
[Ans. sporogony]
- Incubation period for malaria _____.
[Ans. 12 days.]
- Vector for causal agent of kala azar _____.
[Ans. Phlebotomus (sand fly)]
- Causal agent of Athlete's foot _____.
[Ans. Tinea pedis]
- LSD stands for _____.
[Ans. Lysergic acid diethylamide]
- The drug commonly referred to as coke or crack _____.
[Ans. Cocaine]
- Scientific name of Indian hemp plant _____.
[Ans. Cannabis sativa]
- A abusive drug which is also a strong pain killer _____.
[Ans. Morphine]
- A memory disorder caused by misuse of alcohol _____.
[Ans. Korsakoff syndrome]
- Neurotransmitters produced by body which can suppress depression _____.
[Ans. Serotonin and endorphins]
- A virus which can become a surgical weapon against brain cancer _____.
[Ans. Zika virus]
- The first pest to be eliminated by integrated area-wide approach using sterile insect technique _____.
[Ans. Screw-worm fly]
- World malaria day is celebrated on _____.
[Ans. 25th April]
- Name two mosquito free countries in the world _____.
[Ans. Iceland and Faroe Islands]
- Scarring of the liver _____.
[Ans. Liver cirrhosis]

VERY SHORT ANSWERS

2 Marks

- Define communicable diseases.
Ans. Diseases which are transmitted from one person to another are called infectious diseases or **communicable diseases**. Eg: tuberculosis
- Name the phases in the life cycle of *Plasmodium*.
Ans. Schizogony, gametogony and sporogony



3. What are non-infectious diseases?

4. Name the causal agent of swine flu. Mention two symptoms.

Ans. Causal agent of Swine flu : H1N1 virus strain
Symptoms: sore throat, fever, cough, body ache and weakness

5. What is a zoonotic virus?

Ans. A virus which is transmitted from animals to human beings is called zoonotic virus.
Eg: *Nipah virus*.

6. Name two RNA viruses which cause diseases in humans.

Ans. Rubella Virus – causes Measles
Polio virus - causes Poliomyelitis

7. Name two mosquito species which act as vectors for diseases.

Ans. Mosquito vector	Disease
(a) <i>Aedes aegypti</i>	- Dengue fever
(b) Female <i>Anopheles</i> mosquito	- Malaria

8. Name the causal agent of African sleeping sickness and the vector.

Ans. Casual agent – *Trypanosoma gambiense*
Vector – Tsetse fly

9. What is a digenic organism?

Ans. (i) An organism which completes its life cycle in two hosts is said to be digenic.

(ii) **Eg:** *Plasmodium vivax* which causes malaria is a digenic parasite invading man as secondary host and female *Anopheles* mosquito as primary host.

10. How can we prevent malaria?

Ans. (i) It is possible to break the transmission cycle by killing the insect vector. Mosquitoes lay their eggs in water.

(ii) Larvae hatch and develop in water but breathe air by moving to the surface.

- (iii) Oil can be sprayed over the water surface, to make it impossible for mosquito larvae and pupae to breathe.

11. What is korsakoff syndrome?

Ans. It is a chronic memory disorder caused by alcohol misuse.

12. Name the causal agent of Quartan malaria and Mild tertian malaria.

Ans. (i) Quartan malaria – *Plasmodium malariae*
(ii) Mild tertian Malaria – *Plasmodium ovale*

13. What is sporogony?

Ans. In the life cycle of *plasmodium*, the oocyte undergoes meiosis by a process called sporogony to form sporozoites. This takes place in the gut of the mosquito.

14. What is haemozoin?

Ans. It is a toxin produced by lysis of insected red blood cells in a person affected with malaria. This causes malaria symptoms such as fever, chills, shivering etc.,

15. Differentiate male and female *Ascaris*.

Ans. (i) Male *Ascaris* is shorter than female *Ascaris*.
(ii) The posterior end of the male worm is carried whereas in female worm this is not found.

16. How is Ascaris transmitted?

Ans. It is transmitted through ingestion of embryonated eggs through contaminated food and water. Children playing in contaminated soils are also prone to have a chance of transfer of eggs from hand to mouth.

17. Name two plants with hallucinogenic properties.

Ans. *Atropa belladonna* and *Datura*.

18. List the signs and symptoms of mental depression.

Ans. (i) Loss of self confidence and self esteem

(ii) Anxiety

- (iii) Not being able to enjoy things that are usually pleasurable or interesting.

SHORT ANSWERS

3 Marks

1. What is signet ring stage?

Ans. Inside the human RBC, the merozoite of plasmodium begins to develop as unicellular trophozoites. The trophozoite grows in size and a central vacuole develops pushing them to one side of cytoplasm and becomes the **signet ring stage**.

LONG ANSWERS**5 Marks****1. List any five bacterial diseases causative agents, mode of transmission of syndrome.****Ans.**

No	Diseases	Causative agent	Site of infection	Mode of transmission	Symptoms
1	Shigellosis (Bacillary dysentery)	<i>Shigella sp.</i>	Intestine	Food and water contaminated by faeces / faecal oral route	Abdominal pain, dehydration, blood and mucus in the stools
2	Bubonic plague (Black death)	<i>Yersinia pestis</i>	Lymph nodes	Rat flea vector- <i>Xenopsylla cheopis</i>	Fever, headache, and swollen lymph nodes
3	Diphtheria	<i>Corynebacterium diphtheriae</i>	Larynx, skin, nasal and genital passage	Droplet infection	Fever, sore throat, hoarseness and difficulty in breathing
4	Cholera	<i>Vibrio cholerae</i>	Intestine	Contaminated food and water/ faecal oral route	Severe diarrhoea and dehydration
5	Tetanus (Lock jaw)	<i>Clostridium tetani</i>	Spasm of muscles	Through wound infection	Rigidity of jaw muscle, increased heart beat rate and spasm of the muscles of the jaw and face

2. Write a note on any two protozoen diseases.

Ans. (i) Causal agent: Amoebiasis or amoebic dysentery or *Entamoeba histolytica*, which lives in the human large intestine and feeds on food particles and bacteria. Infective stage of this parasite is the **trophozoite**, which penetrates the walls of the host intestine (colon) and secretes histolytic enzymes.

Symptoms Causes: Ulceration, bleeding, abdominal pain and stools with excess mucus. Symptoms can range from diarrhoea to dysentery with blood and mucus in the stool.

Mode of transmission: House flies (*Musca domestica*) acts as a carrier for transmitting the parasite from contaminated faeces and water.

(ii) Causal agent: Kala-azar or visceral leishmaniasis - *Leishmania donovani*.

Symptoms: Weight loss, anaemia, fever, enlargement of spleen and liver.

Mode of Transmission: It is transmitted by the vector *Phlebotomus* (**sand fly**). Infection may occur in the endothelial cells, bone marrow, liver, lymph glands and blood vessels of the spleen.

3. List any five viral diseases, their causative agents, site of infection, mode of transmission and symptoms.**Ans.**

S. No	Diseases	Causative agent	Site of infection	Mode of transmission	Symptoms
1	Common cold	<i>Rhino viruses</i>	Respiratory tract	Droplet infection	Nasal congestion and discharge, sore throat, cough and headache
2	Mumps	<i>Mumps virus</i> (RNA virus) <i>Paramyxovirus</i>	Salivary glands	Saliva and droplet infection	Enlargement of the parotid glands
3	Measles	<i>Rubella virus</i> (RNA virus), <i>Paramyxovirus</i>	Skin and respiratory tract	Droplet infection	Sore throat, running nose, cough and fever. reddish rashes on the skin, neck and ears

S. No	Diseases	Causative agent	Site of infection	Mode of transmission	Symptoms
4	Viral hepatitis	Hepatitis - B virus	Liver	Parenteral route, blood transfusion	Liver damage, jaundice, nausea, yellowish eyes, fever and pain in the abdomen
5	Chicken pox	Varicella - Zoster virus (DNA Virus)	Respiratory tract, skin and nervous system	Droplet infection and direct contact	Mild fever with itchy skin, rash and blisters

4. Explain the events in life cycle of plasmodium in the secondary host/Man.

- Ans. (i)** *Plasmodium vivax* is a digenic parasite, involving two hosts, man as the secondary host and female *Anopheles* mosquito as the primary host. The life cycle of *Plasmodium* involves three phases namely **schizogony, gamogony and sporogony (Fig.)**
- (ii)** The parasite first enters the human blood stream through the bite of an infected **female *Anopheles*** mosquito. As it feeds, the mosquito injects the saliva containing the **sporozoites**.
- (iii)** The sporozoites within the blood stream enter the hepatic cells of the liver and undergoes multiple asexual fission (**schizogony**). This produces **merozoites** which are released from liver cells.
- (iv)** The merozoites penetrate the RBC's. Inside the RBC of Blood, the merozoite of *Plasmodium* to develop as unicellular trophozoites. The trophozoite grows in size and a central vacuole develops pushing them to one side of cytoplasm and becomes the **signet ring stage**.
- (v)** The trophozoite nucleus then divides asexually to produce the **schizont**. The schizont divides and produces mononucleated merozoites.
- (vi)** Eventually the erythrocyte lyses, releasing the merozoites and haemozoin toxin into the blood stream to infect other erythrocytes. Lysis of red blood cells results in cycles of fever and other symptoms. This erythrocytic stage is cyclic and repeats itself approximately every **48 to 72 hours** or longer depending on the species of *Plasmodium* involved. The sudden release of merozoites triggers an attack on the RBCs.
- (vii)** Occasionally, merozoites differentiate into **macrogametocytes** and **microgametocytes**. When these are ingested by a mosquito, they develop into male and female gametes respectively.

