

HUMAN HEALTH AND DISEASE

One Mark Question

Q1. Write the scientific name of the causative organism of elephantiasis.

Ans. *Wuchereria* (*W. bancrofti*, *W. malayi*)

Q2. What is the test used to confirm typhoid?

Ans. Widal Test

Q3. Smack is common drug which is consumed by many persons. Name the plant from which it is obtained.

Ans Latex of poppy plant

Q4. Breast fed babies are more immune to diseases than the bottle-fed babies. Why?

Ans. The mother's milk consists of antibodies (Ig A) such antibodies are not available to bottle fed babies.

Q5. Name the pathogen of malaria.

Ans. *Plasmodium*

Q6. Define auto immune disorder.

Ans. Auto-immune disease refers to the disease when body's immune system due to genetic or other unknown reasons starts destroying self-cells and molecules, e.g., rheumatoid arthritis and systemic lupus.

Q7. Name the parasite which causes amoebiasis.

Ans. *Entamoeba histolytica*

Q8. Name any two types of cells that act as 'cellular barriers' to provide innate immunity in humans

Ans. Certain type of leucocytes (such as PMNL- neutrophils, monocytes) and natural killer cells are two types of cells that act as 'cellular barriers' to provide innate immunity in humans.

Q9. Name the two intermediate hosts on which the human liver fluke depends to complete its life cycle so as to facilitate parasitisation of its primary host

Ans. The human liver fluke requires two intermediate hosts, i.e. freshwater snail and fish to complete their life cycle and facilitate parasitisation of its primary host.

Q10. What is it that prevent a child to suffer from a disease he/she is vaccinated against? Give one reason.

Ans. Vaccination produce antibodies in large numbers, which protect the child by neutralizing the pathogenic agents during infection. The vaccine also generates memory B and T-cells.

TWO MARK QUESTION

Q1. Name an allergen and write the response of human body when exposed to it.

Ans the allergen can be pollen grains, spores or dust particles.

When the allergens are inhaled or enter body system, they stimulate body to produce IgE antibodies and trigger an anti-allergic reaction. The chemical such as histamine and serotonin are released from mast cells, in response to allergen, thereby causing dilation of blood vessels. The other symptoms of allergy, i.e. sneezing, watery eyes, running nose, etc.

Q2. Differentiate between active and passive immunity.

Ans.

ACTIVE IMMUNITY	PASSIVE IMMUNITY
Develops when body's own cell produces antibodies in response to infection	Develops when antibody produced in another organism are injected into a person

Slow in response but long lasting	Provides immediate relief
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Q3. Name the parasite that causes filariasis in humans. Mention its two diagnostic symptoms. How is this transmitted to others? 2

Ans. Wuchereria (*W. bancrofti* and *W. malayi*) are the filarial worms that cause filariasis in humans.

Diagnostic Symptoms

(i) Collection of fluid causes swelling in arms, breasts, legs and genital region.

(ii) Inflammation in lower limbs, resulting in deformities.

It is transmitted to a healthy person through the bite of the female mosquito vector, Culex.

Q4. (i) Name the group of viruses responsible for causing AIDS in humans. Why are these viruses so named? 2

(ii) List any two ways of transmission of HIV infection in humans other than sexual contact?

Ans. (i) Retrovirus is the group of viruses causing AIDS in humans. They contain RNA as genetic material and with the help of enzyme reverse transcriptase they make DNA or RNA template. Thus, they are called retrovirus.

(ii) (a) By sharing infected needles.

(b) By transfusion of blood contaminated with HIV

Q5. Why is an antibody represented H_2L_2 ? 2

Ans. Antibody is represented as H_2L_2 because each antibody molecule has four peptide chains, i.e., two small light (L) chains and two longer heavy (H) chains.

Q6. What is colostrum? Why is it important to be given to the newborn infants? 2

Ans. Colostrum is the milk produced by mother during initial days of lactation. Colostrum contains antibody IgA that provides protection against disease, thus protecting the newborn infants.

Q7. Given below are the pathogens and the diseases caused by them. Which out of these pairs is

not correct matching pair and why?

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- (a) *Wuchereria* . Filariasis
- (b) *Microsporum*. Ringworm
- (c) *Salmonella*. Common Cold
- (d) *Plasmodium*. Malaria

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

Q8. What would happen to the immune system, if thymus gland is removed from the body of a person? 2

Ans. T-lymphocytes develop and mature in thymus gland, Immune system will become weak on removal of thymus gland

THREE MARK QUESTION

Q1. What are Cannabinoids? From which plant Cannabinoids are obtained? Which part of the body? 3

is affected by consuming these substances?

Ans. Cannabinoids are a group of chemicals which interact with Cannabinoid receptors present principally in the brain. Cannabinoids are obtained from the inflorescences of the plant *Cannabis sativa*.

The substances affect the cardiovascular system adversely.

Q2. (i) Name the causative organisms for the following diseases.

- (a) Elephantiasis
- (b) Ringworm
- (c) Amoebiasis

(ii) How can public hygiene help control such diseases? 3

Ans. (i) The causative agent or organism for following diseases are:

(a) Elephantiasis is caused by *Wuchereria bancrofti* and *W. malayi*.

These affect lower limbs and genital organs.

(b) Ringworm is caused by *Microsporum*, *Trichophyton* and *Epidermophyton*.

They affect the skin, nails and scalp.

(c) *Entamoeba histolytica* is a protozoan parasite in the large intestine of human, which causes amoebiasis (amoebic dysentery).

(ii) Maintenance of public hygiene such as:

- keeping body and surroundings clean.
- consumption of clean drinking water, fruits and vegetables, etc.
- regular cleaning and disinfection of tanks and other water reservoirs, etc.

Q3. What is innate immunity? List the four types of barriers which protect the body from the entry

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of the foreign agents.

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

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

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

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

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

Q4. (i) Name the causative agent of typhoid in humans.

(ii) Name the test administered to confirm the disease.

(iii) How does the pathogen gain entry into the human body? Write the diagnostic symptoms and mention the body organ that gets affected in severe cases?

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Ans. (i) *Salmonella typhi*.

(ii) Widal test.

(iii) Pathogens enter the human body through contaminated food and water.

Symptoms of typhoid are:

- (a) Constant high fever (39-40°C)
- (b) Weakness and headache
- (c) Stomach pain
- (d) Loss of appetite

Intestinal (small intestine) perforation in severe cases which may cause death.

Causative agent – Salmonella typhi

FIVE MARK QUESTION

Q1. (i) Cancer is one of the most dreaded diseases. Explain 'contact inhibition' and 'metastasis' with respect to disease.

(ii) Name the group of genes that have been identified in normal cells that could lead to cancer. How do these genes cause cancer?

(iii) Name any two techniques that are useful in detecting cancers of internal organs.

(iv) Why are cancer patients after given α -interferon as part of the treatment? 5

Ans. (i) 'Contact inhibition' is the property exhibited by normal cells. It prevents their uncontrolled proliferation when they are in contact with other neighboring cells. But cancerous cells seem to have lost this property and continue to divide despite being in contact with other cells, which leads to masses of cells called tumours. 'Metastasis' is the property exhibited by malignant tumours which grows rapidly, invades, neighboring tissues and is capable of reaching distant sites through blood and lymph thus, spreading malignant tumours to other organs or parts of body.

These two properties make 'cancer' one of the dreaded diseases.

(ii) The group of genes called oncogenes or proto-oncogenes in normal cells could lead to cancer.

These genes are present in inactivated or suppressed form. Some factors, i.e. physical, chemical or biological called carcinogens are capable of activating these oncogenes and thus transforming normal cells into cancerous one.

The two techniques useful in detecting cancers of internal organs, are CT (Computed Tomography) and MRI (Magnetic Resonance Imaging).

(iv) As tumour cells are capable of avoiding recognition and destruction by immune system, the cancer patients are given α -interferons which are biological response modifiers. It helps activate the immune system and destroy tumours.

Q2. The immune system of a person is suppressed. He was found positive for a pathogen in the diagnostic test ELISA. 5

(a) Name the disease, the patient is suffering from.

(b) Which pathogen is identified by ELISA test?

(c) Which cells of the body are attacked by the pathogen?

(d) Suggest preventive measure of the infection.

Ans. (i) AIDS (Acquired Immune Deficiency Syndrome)

(ii) HIV (Human Immunodeficiency Virus)

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

(iv) Preventive measures:

(a) People should be educated about AIDS transmission.

(b) Disposable needles and syringes should be used

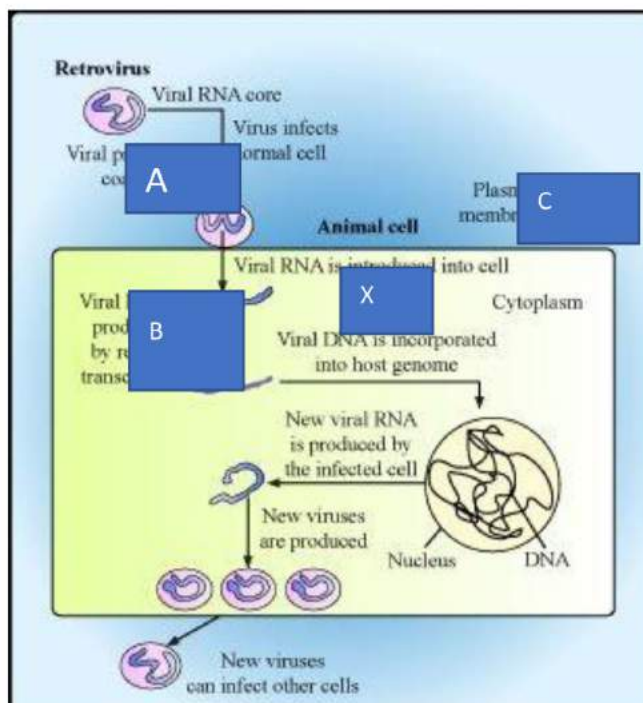
(c) Sexual habits should be changed immediately

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

(e) Routine screening may be done

Q3. Study the diagram showing replication of HIV in humans and answer the following questions accordingly.

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(i) Write the chemical nature of the coat

(ii) Name the enzyme B acting on X to produce molecule C. Name C.

(iii) Mention the name of the host cell D the HIV attacks first when it enters into the human body.

(iv) Name the two different cells the new viruses E subsequently attack.

Ans. (i) A – Protein coat

(ii) B – Reverse transcriptase C – It is viral DNA

(iii) Macrophage (animal or human cell)

(iv) Macrophages and helper T-cells.

CASE BASED QUESTION

Q1. Read the following and answer the following question:

Some of the human diseases are caused by protozoans too. You might have heard about *malaria*; a disease man has been fighting since many years. *Plasmodium*, a tiny protozoan is responsible for this disease. Different species of *Plasmodium* (*P. vivax*, *P. malaria* and *P. falciparum*) are responsible for different types of malaria. Of these, malignant malaria caused by *Plasmodium falciparum* is the most serious one and can even be fatal.

In malaria which of the following is released in blood to cause severe chill

- (a) hematin
- (b) haemozoin
- (c) haemoglobin
- (d) haemolysin

Ans. Haemozoin

_____ Is the infectious form of plasmodium

- (a) sporozoite
- (b) gametocyte
- (c) wuchereria
- (d) aedes

Ans. Sporozoite

Where will you look for the sporozoites of the malarial parasite?

- (a) Saliva of infected female anopheles' mosquito
- (b) RBC of humans suffering from malaria
- (c) Spleen of infected humans
- (d) Salivary glands of freshly moulted female anopheles' mosquito

Q2. A patient showed symptoms of sustained high fever, stomach pain and constipation, but no blood clot in stools. Name the disease and its pathogen. Write the diagnostic test for the disease. How does the disease get transmitted?

Ans. Typhoid is the disease that show symptoms, i.e. high fever, stomach pain and constipation. Its causative agent is *Salmonella typhi*. Widal test is used for its diagnosis. Typhoid is transmitted through contaminated food and water

Q3. Community service department of your school plans a visit to a slum near the school with an objective educate the slum dwellers with respect to health and hygiene.

(i) Why is there a need to organise such visits?

(ii) Write the steps you will highlight, as a member of this department, in your interactions with them to enable them to lead a healthy life

Ans. (i) Slums are generally unauthorised and encroached colonies with no public facilities and organization. Due to lack of education, cleanliness and other facilities and the poor living standard in terms of health, hygiene and nutrition such people are always at risk of acquiring infections. Therefore, there is a need to organise visits to slums so as to educate and create awareness among them regarding the importance of hygiene.

(ii) The points to be highlighted while interacting with the slum people may be.

- Importance of cleanliness and hygiene of body as well as surroundings.
- Awareness and prevention of infectious diseases.
- Use of public facilities, i.e. toiletries.

Q3. person with this pathogen suffers with chill and high fever.

(a) Identify the disease.

(b) Name the pathogen.

(c) What is the cause of fever?

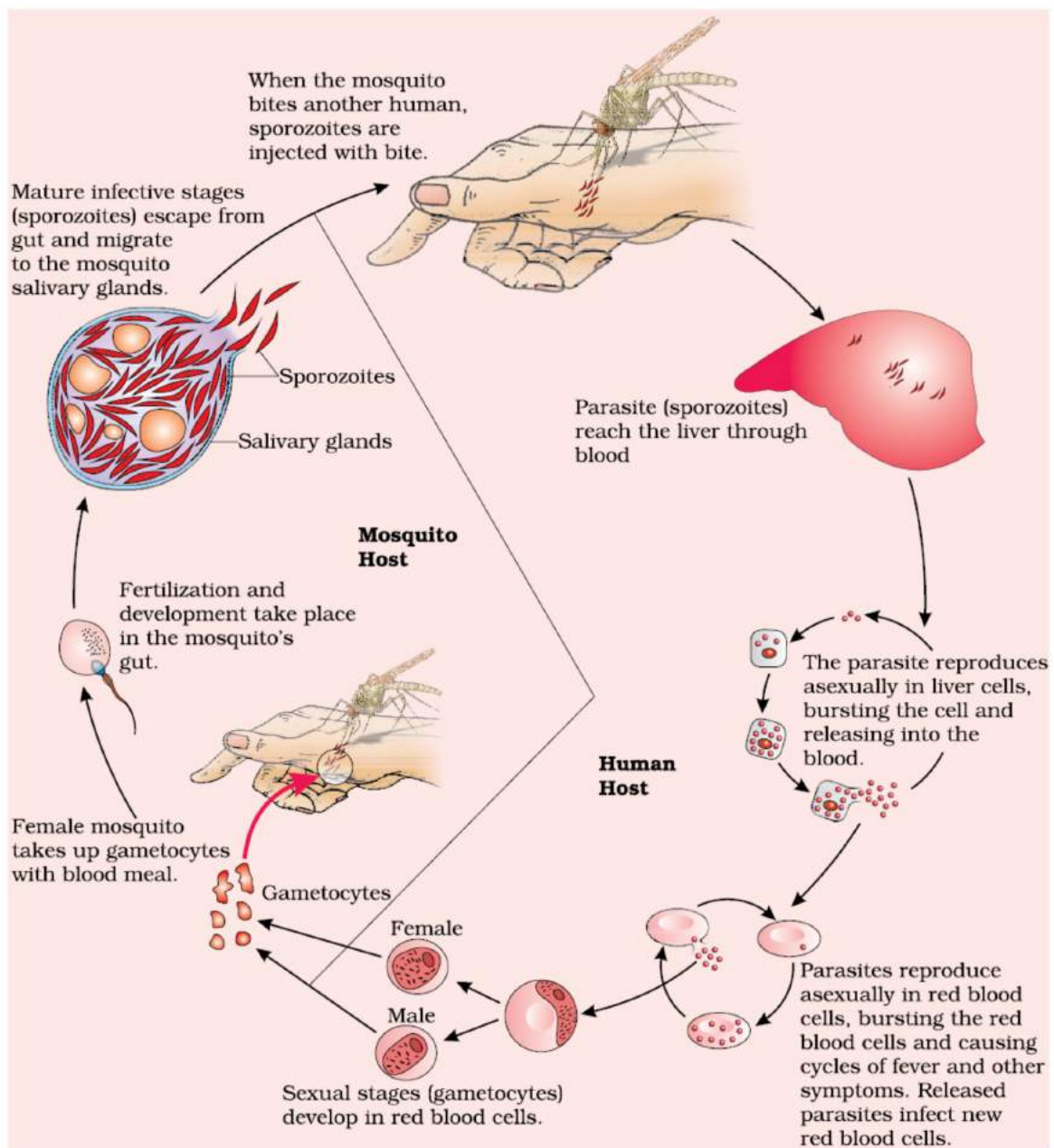
(d) Represent the life cycle of the pathogen diagrammatically.

Ans. (a) Malaria

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

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

(d) Life cycle of *Plasmodium*



ASSERTION REASON BASED QUESTION

Read the question and choose any of the following four responses:

- A. If both Assertion and Reason are true and reason is correct explanation of assertion.
- B. If both assertion and reason are true but reason is not correct explanation of assertion
- C. If assertion is true but reason is false
- D. If both assertion and reason are false

Q1. Assertion: tapeworm, roundworm and pinworm are endoparasite of human intestine

Reason: improperly cooked food is the source of intestinal infection.

Ans B

Q2. Assertion: dope test is used to estimate the level of blood alcohol by analyzing the breath of person drinking alcohol

Reason: a drunken person usually feels tense and is less talkative.

Ans. D

Q3. There is no chance of transmission of malaria to a men by the bites of a a male anopheles mosquito.

Reason: it carries a non-virulent strain of plasmodium.

Ans. C

Q4. Minerals are not biologically active substance.

Reason: some individual suffers from anemia due to deficiency of copper

Ans. D