

Class: 12
Subject: Biology
Topic: Human Health and Disease
No. of Questions: 25

Q1. What are the various routes by which transmission of human immunodeficiency virus takes place?

Sol. AIDS is transmitted only by a contact of infected cells containing blood of a patient with the blood of a healthy person as in (i) unprotected (without condom) sexual intercourse with the infected partner if there is tissue injury to permit blood contact.

(ii) Use of contaminated needles and syringes to inject drugs or vaccines.

(iii) Use of contaminated razors for sharing.

(iv) Use of contaminated needles for boring pinnae.

(v) Transfusion of infected blood or blood products.

(vi) Organ transplant.

(vii) Artificial insemination.

(viii) Parturition from mother to body due to rupturing of blood vessels.

Q2. Explain what is meant by metastasis.

Sol. Malignant tumours are a mass of proliferating cells called neoplastic. They grow rapidly and invade and damage the surroundings normal tissue. As the tumour cells divide actively and grow, they even starve the normal cells by competing for necessary nutrients. Cells get sloughed from such tumours and migrate to distant sites through blood. At new places of establishment, they start a new tumour. This property is called metastasis.

Q3. A boy of 10 years had chicken pox. He is not expected to have the same disease for the rest of his life. Mention how it is possible.

Sol. In case of first infection, antibody formation occurred slowly and the virus had the time to spread. The cells capable of producing antibodies against chicken pox disease persist in the body as 'memory cells' after first infection. They quickly become active to produce antibodies on further infection. The antibodies overcome the infection fully. Hence, disease does not appear again.

Q4. List the specific symptoms of typhoid. Name its causative agent.

Sol. (i) Constant high temperature in 1st and 2nd week, followed by gradual decreased fever in 3rd and 4th week.

(ii) Headache, extreme weakness, abdominal pain, constipation.

(iii) Inflammation in ileum and colon. Causative agent is Salmonella typhi bacterium.

Q5. Name one plant and the addictive drug extracted from its latex. How does this drug affect the human body?

Sol. (i) Papaver somniferum (Poppy plant) and the addictive drug extracted from its latex is morphine. It is widely used as a sedative and an anxiolytic agent. It is widely used in small doses to relieve pain and induce sleep in cases of serious injuries, burns, fractures and surgeries. Its continued use may cause dependence.

It reduces heart beat, blood pressure and urine output, increases blood sugar and causes constipation.

Q6. Why does a doctor administer tetanus antitoxin and not a tetanus vaccine to a child injured in a roadside accident with a bleeding wound? Explain.

Sol. Doctor administers tetanus antitoxin to a child injured in a road side accident with a bleeding wound, so that his body quickly is able to interact with pathogens (antigens) and destroy them with antibodies.

Q7. The immune system of a person is suppressed. In the Elisa test, he was found positive to a pathogen.

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

(b) What is the causative organism?

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

Sol. (a) AIDS (Acquired Immunodeficiency syndrome)

(b) HIV (Human Immunodeficiency Virus)

(c) Helper T-lymphocytes.

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

Sol. Thymus is the primary lymphoid organ. In thymus, immature lymphocytes differentiate into antigen-sensitive-lymphocytes. If thymus gland is removed, person's immune system will become weak and he will be more prone to infectious diseases.

Q9. Many microbial pathogens enter the gut of humans along with food. What are the preventive barriers to protect the body from such pathogens? What type of immunity do you observe in this case?

Sol. (i) The mucus coating of the gut epithelium helps in trapping the microbes that enter the body.
(ii) Saliva in buccal cavity prevents microbial growth.
(iii) HCl present in gastric juice also prevents microbial growth. Such a immunity is termed innate immunity.

Q10. What are interferons? How do interferons check infection of new cell?

Sol. Interferons are antiviral proteins produced by cells when invaded by a virus. These are released from the infected and dying host cells. On reaching the nearby uninfected cells, it makes them resistant to the viral infection by the formation of certain proteins which prevent viral multiplication.

Q11. A student of a school trip started sneezing and wheezing soon after reaching the hill station for no explained reasons. But, on return to the plains, the symptoms disappeared. What is such a response called? How does the body produce it?

Sol. The responses such as sneezing and wheezing for no explained reasons is called allergy. The substances against which the immune system shows such exaggerated response are termed as allergens. Body produces IgE type of antibody against allergens as a response. Most common example of such allergens are pollen grains, dust etc.

- Q12. A young boy when brought a pet dog home started to complain of watery eyes and running nose. The symptoms disappeared when the body was kept away from the pet.
- (a) Name the type of antibody and the chemicals responsible for such a response in the boy.
 - (b) Mention the name of any one drug that could be given to the body for immediate relief such a response.

Sol. (a) The IgE type of antibody and chemicals like histamine and serotonin released from mast cells are responsible for this response.
(b) Drugs like anti histamine, adrenalin and steroids can be given to the boy for immediate relief from such a response.

- Q13 How do the tranquillizers differ from the sedatives?

Sol. **Tranquillizers** are the drugs which lessen tension and anxiety, and promote calmness and soothing without sedating or depressant effect and do not induce sleep. On the other hand, **sedatives** are the drugs which depress the activities of the central nervous system. They reduce excitement, assuage pain, and give a feeling of calmness, relaxation or drowsiness.

- Q14. Answer the following question:
- (a) How are the cancer cells different from normal cells?
 - (b) Pick out correct carcinogens out of the following:
Asbestos, infra red rays, arsenic, polythene, casein, caffeine, tobacco smoke, Gamma rays.
 - (c) Write down three methods (write full forms wherever required) to detect cancer of internal organs.

Sol. (a)

Cancer Cells	Normal Cells
They do not undergo differentiation.	The undergo differentiation.
Cancer cells undergo uncontrolled divisions.	Cell divisions are regulated,
These cells do not require extracellular growth factors.	These cells require extracellular growth factors.
Cells do not remain adhered.	Cells remain adhered to one another.
Cell death is inhibited.	These cells have finite life span.
These tend to form tumours.	Tumours are not formed.

- (a) The carcinogens are asbestos, gamma rays, tabacco smoke and arsenic.
- (b) Detection and diagnosis of cancer depends upon histological features of malignant structure.

- (i) Biopsy of bone marrow and abnormal count of WBCs is done in leukemia.
- (ii) Pap test (cytological staining) is used for detecting cancer of cervix and other genital tract parts.
- (iii) Radiography, CT scan (Computed Tomography), Magnetic Resonance Imaging (MRI scan) are useful techniques to detect cancer of internal organs.

Q15. In which parts of the body of the hosts do the following events in the life cycle of Plasmodium take place? Name both the body part and the host.

- (a) Fertilization
- (b) Development of gametocytes
- (c) Release of sporozoites

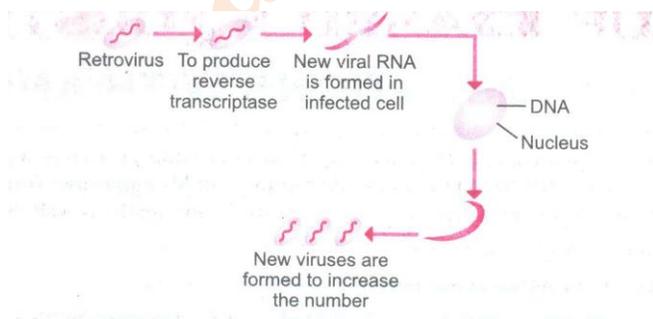
Sol. (a) Fertilization takes place in the mosquito intestine.
(b) Female Anopheles in the stomach.
(c) Female Anopheles mosquito release sporozoites human body.

Q16. A thalasemic child needed repeated blood transfusions, got infected by HIV.

- (I) Use a rough diagrammatic sketch and arrows to show how the virus increased in number.
- (II) Why did the increased number of HIV viruses deteriorate the child's immunity?
- (III) Which diagnostic test showed that the infective virus was HIV?

Sol.

(i)



- (ii) The macrophages continue to produce virus. HIV enter into helper T lymphocytes, replicate and produce progeny viruses. Progeny virus lyse the host cell to attack other helper T lymphocytes. This is repeated and as a result there is decrease in number of helper T lymphocytes in the infected person.
- (iii) Widely used diagnostic test for AIDS is ELISA (Enzyme linked Immunosorbent Assay).

- Q17. (a) In which disease is there an uncontrolled division of cells resulting in the formation of tumours? How is this disease detected?
(b) How do interferons help in controlling the disease?

Sol.

- (a) Cancer disease. Detection of cancer is done by biopsy and many other techniques. Please see Answer to Question 16 (CBSE P.M.T.Mains).
(b) Interferons are antiviral protein produced by viral infected cells. This protein is released from such cells makes the adjacent unaffected cells more resistant to viral infection.

- Q18. (i) Name the term used when the immune system at times reject certain tissues of a person's own body as 'nonself'.
(i) Name any two diseases that occur in human beings.

Sol.

- (i) Autoimmunity.
(ii) Chronic anaemia: Chronic hepatitis.

- Q19. List the causative organism and carrier of the following disease. (i) Dengue fever (ii) Chikungunya

Sol.

- (i) Flavi-ribo virus is causative organism.
Aedes aegypti mosquito is carrier.
(ii) Alpha virus (Chikungunya virus) – causative organism Aedes aegypti mosquito is carrier.

- Q20. Janaki's mother went to see her maid who recently gave birth to a baby. Janaki's mother gifted maid a set of clothes for the new born and advised her to get the child vaccinated timely but maid replied that she was very poor and could not afford the cost of vaccines.

Read the above passage and answer the following questions:

- (i) What are vaccines?
(ii) Name two vaccines given to new born babies.
(iii) How did Janaki's mother help the maid to get her new born vaccinated free of cost?

Sol.

- (i) Vaccine are weakened or dead pathogens injected into a person to make him/her immune.
- (ii) Small pox, polio.
- (iii) Janaki's mother advised the maid to get her child vaccinated at nearby primary health centre free of cost.

Q21. Sarcoma is cancer of (CBSE)

- (a) Epithelial tissue
- (b) Mesodermal tissue
- (c) Blood
- (d) Endodermal tissues

Sol . (b)

Q22. One of the following is used for treatment of thyroid cancer (CBSE)

- (a) U238
- (b) Ra-224
- (c) C-14
- (d) I-131

Sol. (d)

Q23. Which of the following is fourth dimension of health?

- (a) physical
- (b) mental
- (c) spiritual
- (d) social

Ans. (c)

Q24. Deficiency of vitamin C/Ascorbic acid causes (CBSE, DPMT, JIPMER, MP-PMT)

- (a) Rickets
- (b) Beri-beri
- (c) Scurvy
- (d) Night blindness

Ans. (c)

Q25. AZT is used in treatment of (BHU)

- (a) Malaria
- (b) AIDS
- (c) T.B.
- (d) Kala-azar

Sol. (b)

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