

30 Human Health and Diseases

Question: Which of the following sexually transmitted infections are completely curable ?

NEET 2023 Manipur

A HIV infection and Trichomoniasis

B Syphilis and trichomoniasis

C Hepatitis – B and Genital herpes

D Genital herpes and Genital warts

Answer: B

Explanation

Among the options provided, sexually transmitted infections (STIs) caused by bacteria are typically curable with antibiotics, while those caused by viruses are not curable but can be managed.

Option A : HIV infection and Trichomoniasis - HIV is a viral infection and currently has no cure, but it can be managed with antiretroviral therapy. Trichomoniasis is a parasitic infection and is curable with antibiotics.

Option B : Syphilis and Trichomoniasis - Both syphilis and trichomoniasis are curable. Syphilis is a bacterial infection and can be cured with antibiotics, typically penicillin. Trichomoniasis, as mentioned above, is a parasitic infection that can also be cured with antibiotics.

Option C : Hepatitis – B and Genital herpes - Both are viral infections and, while their symptoms can be managed, they are not curable.

Option D : Genital herpes and Genital warts - Both are caused by viruses (Herpes simplex and Human papillomavirus respectively) and, while their symptoms can be managed, they are not curable.

So, the correct answer is :

Option B : Syphilis and trichomoniasis.

Question: Which one of the following common sexually transmitted diseases is completely curable when detected early and treated properly?

NEET 2023

A Gonorrhoea

B Hepatitis-B

C HIV Infection

D Genital herpes

Answer: A

Explanation

Gonorrhoea is a sexually transmitted disease caused by the bacterium *Neisseria gonorrhoeae*. It can be effectively treated with antibiotics, especially when detected early.

Hepatitis B, HIV Infection, and Genital Herpes are caused by viruses. These viral infections can be managed with antiviral therapy but they are typically not completely curable.

So, the correct answer is :

Option A : Gonorrhoea

Question: Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment?

NEET 2023

- ☒ A Serum and Urine analysis
- ☐ B Polymerase Chain Reaction (PCR) technique
- ☐ C Enzyme Linked Immuno-Sorbent Assay (ELISA) technique
- ☐ D Recombinant DNA Technology

Answer: A

Explanation

The correct answer is option (A) because using conventional methods of diagnosis like serum and urine analysis, etc, do not help in early diagnosis.

Recombinant DNA technology, Polymerase Chain Reaction [PCR] and Enzyme Linked Immuno-Sorbent Assay (ELISA) are some of the techniques that serve the purpose of early diagnosis.

Question: In which blood corpuscles, the HIV undergoes replication and produces progeny viruses?

NEET 2023

A B-lymphocytes

B Basophils

C Eosinophils

D T_H cells

Answer: D

Explanation

HIV, or the Human Immunodeficiency Virus, primarily infects CD4+ T cells, which are a type of T cell. In the context of the options given, TH cells, or T helper cells, are a subset of CD4+ T cells.

So, the correct answer is :

Option D : TH cells

Question: Match List I with List II.

NEET 2023

	List I		List II
(A)	Heroin	(I)	Effect on cardiovascular system
(B)	Marijuana	(II)	Slow down body function
(C)	Cocaine	(III)	Painkiller
(D)	Morphine	(IV)	Interfere with transport of dopamine

Choose the correct answer from the options given below:

A A-I, B-II, C-III, D-IV

B A-IV, B-III, C-II, D-I

C A-III, B-IV, C-I, D-II

D A-II, B-I, C-IV, D-III

Answer: D

Explanation

The correct answer is option (D) as

- Heroin belongs to the category of opioids and it is a depressant that slows down body functions.
- Marijuana is known for its effect on the cardiovascular system of the body.

· Cocaine interferes with the transport of the neurotransmitter dopamine.

Morphine is used as a sedative and painkiller.

Question: Match List I with List II.

NEET 2023

	List I		List II
(A)	Ringworm	(I)	Haemophilus influenzae
(B)	Filariasis	(II)	Trichophyton
(C)	Malaria	(III)	Wuchereria bancrofti
(D)	Pneumonia	(IV)	Plasmodium vivax

Choose the correct answer from the options given below:

A A-II, B-III, C-I, D-IV

B A-III, B-II, C-I, D-IV

C A-III, B-II, C-IV, D-I

D A-II, B-III, C-IV, D-I

Answer: D

Explanation

The diseases listed in List I are caused by the organisms listed in List II :

- Ringworm is caused by the fungus Trichophyton.

- Filariasis is caused by the parasite *Wuchereria bancrofti*.
- Malaria is caused by the protozoan *Plasmodium* species (including *Plasmodium vivax*).
- Pneumonia can be caused by a variety of organisms, including the bacterium *Haemophilus influenzae*.

Therefore, the correct answer is :

Option D : A-II, B-III, C-IV, D-I

2022

MCQ (Single Correct Answer)

Q.1. Which of the following reasons is mainly responsible for graft rejection in transplantation of organs?

☒ A Cell-mediated response

☐ B Inability of recipient to differentiate between 'self' and 'non-self' tissues/cells

☐ C Humoral immune response only

☐ D Auto-immune response

NEET 2022 Phase 2

Ans. (A)

Explanation

Option (1) is the correct answer as the body is able to differentiate between 'self' and 'non-self' and the cell-mediated immune response is responsible for the graft rejection.

Option (2) is incorrect as body of higher vertebrates have the ability to differentiate foreign organisms from self cells.

Option (4) is incorrect as the autoimmune response occur when the body's immune system fails to recognize 'self' from 'non-self' and starts destroying the body's own cells.

Q.2. Match List - I with List - II:

	List - I		List - II
(a)	Cellular barrier	(i)	Interferons
(b)	Cytokine barrier	(ii)	Mucus

	List - I		List - II
(c)	Physical barrier	(iii)	Neutrophils
(d)	Physiological barrier	(iv)	HCl in gastric juice

Choose the correct answer from the options given below:

A (a) - (iii), (b) - (i), (c) - (ii), (d) - (iv)

B (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)

C (a) - (ii), (b) - (iii), (c) - (i), (d) - (iv)

D (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)

NEET 2022 Phase 2

Ans. (A)

Explanation

Option (a) is the correct answer because cellular barriers include NK cells, macrophages (monocytes) and neutrophils (PMNL).

Cytokine barriers include interferons.

Physical barriers include mucus membranes and skin.

Physiological barriers include HCl in gastric juice, saliva and tears etc.

Q.3. Given below are two statements:

Statement I: Autoimmune disorder is a condition where body defense mechanism recognizes its own cells as foreign bodies.

Statement II: Rheumatoid arthritis is a condition where body does not attack self cells.

In the light of the above statements, choose the most appropriate answer from the options given below:

- ☐ A Both Statement I and Statement II are correct
- ☐ B Both Statement I and Statement II are incorrect
- ☒ C Statement I is correct but Statement II is incorrect
- ☐ D Statement I is incorrect but Statement II is correct

NEET 2022 Phase 1

Ans. (C)

Explanation

Option (c) is the correct answer as autoimmune disorder is a condition where body defense mechanism recognises its own cells as foreign bodies. Sometimes, due to genetic and other unknown reasons, the body attacks self-cells.

Rheumatoid arthritis is an example where body attacks self cells (synovial membrane).

So Statement I is correct but Statement II is incorrect.

Q.4. Select the incorrect statement with respect to acquired immunity.

- ☐ A Primary response is produced when our body encounters a pathogen for the first time.
- ☐ B Anamnestic response is elicited on subsequent encounters with the same pathogen.
- ☐ C Anamnestic response is due to memory of first encounter.
- ☐ D Acquired immunity is non-specific type of defense present at the time of birth.

Ans. (D)

Explanation

Option (d) is the correct answer as acquired immunity is a specific type of defence which is not present at the time of birth.

Option (c), (a) and (b) are true statements and hence cannot be the answer.

Anamnestic response or secondary immune response is a highly intensified response due to memory of first encounter.

When our body encounters a pathogen for the first time then the body elicits the primary immune response.

When there is a subsequent encounter with the same pathogen, secondary or anamnestic immune response is elicited.

TOPIC 1

Common Human Diseases

01 Match the List I with List II.

[NEET 2021]

List I	List II
A. Filariasis	1. <i>Haemophilus influenzae</i>
B. Amoebiasis	2. <i>Trichophyton</i>
C. Pneumonia	3. <i>Wuchereria bancrofti</i>
D. Ringworm	4. <i>Entamoeba histolytica</i>

Choose the correct answer from the options given below.

- A B C D
 (a) 4 1 3 2
 (b) 3 4 1 2
 (c) 1 2 4 3
 (d) 2 3 1 4

Ans. (b)

(A)-(3), (B)-(4), (C)-(1), (D)-(2)

Filariasis or elephantiasis is caused by filarial worm known as *Wuchereria bancrofti*. It affects the lymphatic vessels of lower limbs resulting in gross deformities.

Amoebiasis is a protozoan disease caused by *Entamoeba histolytica* which parasite the large intestine causing constipation, abdominal pain, etc.

Pneumonia is a bacterial disease caused by, *Haemophilus influenzae* and *Sterptococcus pneumoniae* bacteria.

These bacteria infect the alveoli leading to several problems in respiration.

Ringworm is a fungal disease. *Trichophyton*, *Microsporum* are responsible for this disease, resulting in appearance of dry scaly lesions on various parts as the symptoms of this disease.

02 Match the following columns and select the correct option from the codes given below.

[NEET (Oct.) 2020]

Column I	Column II
A. Typhoid	1. <i>Haemophilus influenzae</i>
B. Malaria	2. <i>Wuchereria bancrofti</i>
C. Pneumonia	3. <i>Plasmodium vivax</i>
D. Filariasis	4. <i>Salmonella typhi</i>

Codes

- A B C D
 (a) 4 3 1 2
 (b) 3 4 2 1
 (c) 1 3 2 4
 (d) 1 2 4 3

Ans. (a)

Option (a) is the correct match which is as follows

Typhoid is caused *Salmonella typhi*.

Malaria is caused by *Plasmodium vivax*.

Pneumonia is caused by *Haemophilus influenzae*.

Filariasis is caused by *Wuchereria bancrofti*.

03 Match the following diseases with the causative organism and select the correct option.

[NEET (Sep.) 2020]

Column I	Column II
A. Typhoid	1. <i>Wuchereria</i>
B. Pneumonia	2. <i>Plasmodium</i>
C. Filariasis	3. <i>Salmonella</i>
D. Malaria	4. <i>Haemophilus</i>

- A B C D
 (a) 3 4 1 2
 (b) 2 1 3 4
 (c) 4 1 2 3
 (d) 1 3 2 4

Ans. (a)

Typhoid is caused by bacterium *Salmonella typhi*. Typhoid fever is a type of enteric fever. It spreads by drinking water contaminated with the faeces of an infected person. Fever that starts low and increases daily, possibly reaching as high as 104.9 F (40.5 C), muscle aches, sweating, loss of appetite and weight loss, abdominal pain and diarrhoea or constipation are the symptoms of typhoid.

Pneumonia is caused by bacterium *Haemophilus influenzae*. It is a small, Gram-negative, facultative anaerobic organism which causes infection in the upper respiratory tract. The bacteria are usually transmitted by droplets in the air from a sneeze, cough or close conversation with an infected person.

Filariasis is a parasitic disease caused by infectious worms called *Wuchereria*.

These spread by blood-feeding insects such as black flies and mosquitoes.

Malaria is a life-threatening disease caused by *Plasmodium* parasite. It's typically transmitted through the bite of an infected *Anopheles* mosquito. Infected mosquitoes carry the *Plasmodium* species. After bite, the parasite is released into the bloodstream where it matures and begin to infect RBCs resulting in symptoms that occur in cycles that last two to three days at a time.

- 04** The infectious stage of *Plasmodium* that enters the human body is [NEET (Sep.) 2020]

- (a) sporozoites
- (b) female gametocytes
- (c) male gametocytes
- (d) trophozoites

Ans. (a)

The infectious stage of *Plasmodium* that enters the human body is sporozoites, present in salivary gland of *Anopheles* mosquito. The sporozoites grow and multiply in the liver to become merozoites. These merozoites invade the erythrocytes (RBCs) to form trophozoites, schizonts and gametocytes, during which the symptoms of malaria are produced.

- 05** Identify the correct pair representing the causative agent of typhoid fever and the confirmatory test for typhoid. [NEET (National) 2019]

- (a) *Streptococcus pneumoniae* / Widal test
- (b) *Salmonella typhi* / Anthrone test
- (c) *Salmonella typhi* / Widal test
- (d) *Plasmodium vivax* / UTI test

Ans. (c)

Typhoid fever is caused by the bacterium *Salmonella typhi* and widal test is the confirmatory test for typhoid, which is based on antigen antibody reaction.

Typhoid fever or enteric fever has the incubation period of 1 to 2 weeks and it is usually transmitted through contaminated food and water.

- 06** In which disease does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels? [NEET 2018]

- (a) Ringworm disease
- (b) Ascariasis
- (c) Elephantiasis
- (d) Amoebiasis

Ans. (c)

Elephantiasis is a helminthic disease caused by *Wuchereria bancrofti*. The infestation is transmitted by female *Culex* mosquitoes from one individual to the others. The worms live in the lymphatic system.

Ascariasis is caused by *Ascaris lumbricoides*. It is an endoparasite of the small intestine of human beings.

Amoebiasis is caused by *Entamoeba histolytica*. It lives in the large intestine of humans. **Ringworm** is a fungal skin disease.

- 07** Which of the following sets of diseases is caused by bacteria? [NEET 2016, Phase II]

- (a) Cholera and tetanus
- (b) Typhoid and smallpox
- (c) Tetanus and mumps
- (d) Herpes and influenza

Ans. (a)

Cholera and tetanus are diseases caused by bacteria. Cholera is caused by a bacterium *Vibrio cholerae* and tetanus is caused by a bacterium *Clostridium tetani*. Mumps, influenza, herpes and smallpox are viral diseases. Typhoid is a bacterial disease but it is not paired with a bacterial disease. Hence, option (a) is correct.

- 08** Asthma may be attributed to [NEET 2016, Phase I]

- (a) allergic reaction of the mast cells in the lungs
- (b) inflammation of the trachea
- (c) accumulation of fluid in the lungs
- (d) bacterial infection of the lungs

Ans. (a)

Asthma is an allergic reaction characterised by spasm of bronchi muscles because of effect of histamine released by mast cells.

- 09** Which of the following diseases is caused by a protozoan? [CBSE AIPMT 2015]

- (a) Syphilis
- (b) Influenza
- (c) Babesiosis
- (d) Blastomycosis

Ans. (c)

Babesiosis is a malaria-like parasitic disease caused by infection with *Babesia bigemina*, a genus of protozoa piroplasms.

Syphilis	— <i>Treponema pallidum</i> (bacterium)
Influenza	— Influenza virus
Blastomycosis	<i>Blastomyces dermatitidis</i> (fungus)
—	—

- 10** Infection of *Ascaris* usually occurs by [NEET 2013]

- (a) drinking water containing egg of *Ascaris*
- (b) eating imperfectly cooked pork
- (c) tse-tse fly
- (d) mosquito bite

Ans. (a)

Infection of *Ascaris* occurs in a healthy person due to the contaminated water, vegetables, (raw or uncooked) fruits, etc. Mosquito bite causes malaria due to the entry to *Plasmodium* parasite into the blood by mosquito. Eating imperfectly cooked pork causes trichinosis disease (parasitic disease). Tse-tse fly causes trypanosomiasis, an infection of the central nervous system.

- 11** Widal test is carried out to test [CBSE AIPMT 2012, 10]

- (a) malaria
- (b) diabetes mellitus
- (c) HIV/AIDS
- (d) typhoid fever

Ans. (d)

Widal test is one of the most reliable diagnostic tests for typhoid fever in developing countries since its introduction (over 100 years ago). This test demonstrates the presence of somatic (O) and flagellar (H) agglutinins to *Salmonella typhi* in the patients blood serum using suspensions of O and H antigens. Antigens of *S. paratyphi* A and *S. paratyphi* B are included in most commercial kits.

- 12** Common cold differs from pneumonia in, that [CBSE AIPMT 2012]

- (a) pneumonia is a communicable disease, whereas the common cold is a nutritional deficiency disease
- (b) pneumonia can be prevented by a live attenuated bacterial vaccine, whereas the common cold has no effective vaccine
- (c) pneumonia is caused by a virus, while the common cold is caused by the bacterium *Haemophilus influenzae*
- (d) pneumonia pathogen infects alveoli whereas the common cold affects nose and respiratory passage but not the lungs

Ans. (d)

Pneumonia is caused by the bacteria *Diplococcus pneumoniae* which infects the alveoli of lungs. It generally spreads through the sputum of patient. Fever, cold and difficulty in breathing are some common symptoms of pneumonia. It can be treated by the antibiotics.

Common cold is caused by a variety of viruses, most commonly by rhinovirus (RNA virus). It spreads through droplet infection. It affects the upper respiratory tract but not the lungs. Nasal and bronchial irritation, sneezing and coughing are some common symptoms of cold.

13 Ringworm in humans is caused by
[CBSE AIPMT 2010]

- (a) bacteria (b) fungi
(c) nematodes (d) viruses

Ans. (b)

Ringworm refers to fungal infections occurring on the surface of the skin. Although the world is full of yeasts, moulds and fungi, only a few cause skin problems. These agents are called the dermatophytes. Some common dermatophytic fungi are *Trichophyton rubrum*, *T. tonsurans*, *T. interdigitale*, *T. mentagrophytes*, *Microsporum Canis*, *Albugo candida* and *Epidermophyton floccosum*.

14 Which of the following is a pair of viral diseases? [CBSE AIPMT 2009]

- (a) Ringworm, AIDS
(b) Common cold, AIDS
(c) Dysentery, common cold
(d) Typhoid, tuberculosis

Ans. (b)

Common cold and AIDS are viral diseases, occur due to the rhino virus and Human Immunodeficiency Virus (HIV) respectively. Viral diseases can not be treated by the use of antibiotics.

15 Match the disease in column I with the appropriate items (pathogen/prevention/ treatment) in column II
[CBSE AIPMT 2008]

Column I	Column II
A. Amoebiasis	(i) <i>Treponema pallidum</i>
B. Diphtheria	(ii) Use only sterilised food and water
C. Cholera	(iii) DPT vaccine
D. Syphilis	(iv) Use oral rehydration therapy

- (a) A-(i), B-(ii), C-(iii), D-(iv)
(b) A-(ii), B-(iv), C-(i), D-(iii)
(c) A-(ii), B-(i), C-(iii), D-(iv)
(d) A-(ii), B-(iii), C-(iv), D-(i)

Ans. (d)

Amoebiasis is caused by *Entamoeba histolytica*. Prevention of infection is entirely a matter of hygiene, both personal as well as municipal. Their prevention include use of properly cooked food and sterilized water.

Diphtheria is caused by *Corynebacterium diphtheriae*. The symptoms are fever, sore throat, severe damage to heart, nerve cell and adrenal glands. The vaccine DPT is used for diphtheria, pertussis and tetanus.

Cholera is caused by *Vibrio cholerae*, a Gram negative bacterium. It spreads by faecal contamination. The dehydration and loss of mineral salts can cause death. It is treated by use of oral rehydration therapy.

Syphilis is caused by *Treponema pallidum*, a spirochaete and spread by sexual contact and is STD.

16 Sickle-cell anaemia has not been eliminated from the African population because

[CBSE AIPMT 2006]

- (a) it is controlled by recessive genes
(b) it is not a fatal disease
(c) it provides immunity against malaria
(d) it is controlled by dominant genes

Ans. (c)

Sickle-cell anaemia (in which RBCs become sickle-shaped and stiff) is a genetic disorder that is autosomal and linked to a recessive allele. It has not been eliminated from the African population because it provides immunity against malaria. People who are heterozygous for sickle cell allele are much less susceptible for falciparum malaria which is one of the main causes of illness and death in them. Thus, the sickle cell allele is maintained at high levels in populations where falciparum malaria is common.

17 Both sickle-cell anaemia and Huntington's chorea are

[CBSE AIPMT 2006]

- (a) bacteria-related diseases
(b) congenital disorders
(c) pollutant-induced disorders
(d) virus-related diseases

Ans. (b)

Both sickle-cell anaemia and Huntington's chorea are **congenital genetic disorders**.

Sickle-cell anaemia was first reported by James Herrick (1904). In this disease the patient's haemoglobin level reduced to half of the normal and the RBCs become sickle-shaped. A single mutation in a gene cause sickle-cell anaemia.

Huntington's chorea is caused by autosomal mutation which is dominant. The gene is present on chromosome number 4.

18 Which one of the following is not correctly matched?

[CBSE AIPMT 2004]

- (a) *Glossina palpalis* — Sleeping sickness
(b) *Culex pipiens* — Filariasis
(c) *Aedes aegypti* — Yellow fever
(d) *Anopheles culicifacies* — Leishmaniasis

Ans. (d)

Leishmaniasis or kala-azar is caused by a protozoan, *Leishmania donovani*. It is spread by sand fly. It is also known as dum-dum fever. It's control includes eradication of vector, and use of antibiotics.

19 *Salmonella* is related with

[CBSE AIPMT 2001]

- (a) typhoid (b) polio
(c) TB (d) tetanus

Ans. (a)

Salmonella typhi causes typhoid fever. The incubation period is about two weeks. The patient first suffers from high fever of 40°C and continual headache. Polio, TB and tetanus are caused by polio virus, *Mycobacterium tuberculosis* and *Clostridium tetani* respectively. Polio is being eradicated by polio vaccine. TB and tetanus can be cured by antibiotics.

20 Which of these is most infectious disease? [CBSE AIPMT 2001]

- (a) Hepatitis-B (b) AIDS
(c) Cough and cold (d) Malaria

Ans. (a)

Hepatitis may be transmitted via blood transfusions, contaminated equipment, unsterile needles (of drug addicts), or any body secretion like saliva, sweat, semen, breast milk, urine, faeces. Infection to healthy persons is prevented by proper vaccinations of hepatitis specially hepatitis-B.

- 21** Bovine spongiform encephalopathy is a bovine disease. To which of the following human diseases it is related? [CBSE AIPMT 2000]

(a) Kala-azar
(b) Encephalitis
(c) Cerebral spondylitis
(d) Creutzfeldt Jacob disease

Ans. (d)

Bovine Spongiform Encephalopathy (BSE) is a fatal brain disease known to exist in beef and other dairy cattle in UK, also known as mad cow disease. It is believed to be caused by prions. Creutzfeldt-Jacob Disease (CJD) is a slow degenerative disease among human affecting central nervous system with dysfunction and degeneration of the brain. Some scientists have suggested that a few people in Britain might have contracted CJD by eating BSE-infected beef.

- 22** A patient suffering from cholera is given saline drip because [CBSE AIPMT 1996, 2000]

(a) Cl^- ions are important component of blood plasma
(b) Na^+ ions help to retain water in the body
(c) Na^+ ions are important in transport of substances across membrane
(d) Cl^- ions help in the formation of HCl in stomach for digestion

Ans. (b)

Severe diarrhoea, vomiting, watery stools are the chief symptoms of cholera. All these lead to dehydration. The toxin secreted by *Vibrio cholerae* causes a continuous activation of adenylate cyclase of intestinal epithelial cells.

The resultant high concentration of cAMP triggers continual secretion of Cl^- , HCO_3^- and water into the lumen of the intestine. Administration of saline not only supports the sodium-potassium pump through which water in cell is restored, but glucose is also symported along with sodium.

- 23** Koch's postulates are not applicable to [CBSE AIPMT 1999]
- (a) cholera
(b) leprosy
(c) TB
(d) diphtheria

Ans. (b)

To apply Koch's postulates, we have to culture the suspected causal organism *in vitro*. *Mycobacterium leprae* cannot be cultured *in vitro*. Hence, Koch's postulates are not applicable to leprosy because its incubation period is 2-5 years.

Cholera is caused by *Vibrio cholerae*.

TB is caused by *Mycobacterium tuberculosis*.

Diphtheria is caused by *Mycobacterium diphtheriae*.

- 24** Typhoid fever is caused by [CBSE AIPMT 1998]
- (a) *Giardia* (b) *Salmonella*
(c) *Shigella* (d) *Escherichia*

Ans. (b)

Salmonella typhi causes typhoid fever in human beings. It is characterised by constant fever due to the infection of intestine. *Giardia* is a flagellate protozoan, *lamblia* species of this protozoan causes disease giardiasis, a prolonged diarrhoeal disease of humans.

Bacterial genus *Shigella* causes shigellosis or **bacillary dysentery**.

Escherichia coli is a facultative anaerobes, found in the intestine of human beings.

- 25** Botulism caused by *Clostridium botulinum* affects the [CBSE AIPMT 1998]
- (a) spleen
(b) intestine
(c) lymph glands
(d) neuromuscular junction

Ans. (d)

Clostridium botulinum bacterium causes food poisoning (botulism). *Clostridium* is an obligate anaerobic endospore-forming Gram positive, rod-shaped bacterium. This bacterium produces an exotoxin which is highly toxic for the synaptic ends of the nerves where it blocks the release of **acetylcholine**. Later is a chemical necessary for the transmission of nerve impulse across the synapses.

- 26** Diphtheria is caused by [CBSE AIPMT 1997]
- (a) poisons released by living bacterial cells into the host tissue
(b) poisons released from dead bacterial cells into the host tissue

(c) poisons released by virus into the host tissues
(d) excessive immune response by the host's body

Ans. (a)

Toxins released from *Corynebacterium diphtheriae* cause diphtheria. Actually, bacterial cells do not contain gene for toxin production, i.e. a phage carries the gene for it. Only those lysogenised cell of *C. diphtheriae* which carry β -phage, can produce the toxin and cause diphtheria.

- 27** Which of the following disease is now considered nearly eradicated from India? [CBSE AIPMT 1997]
- (a) Smallpox (b) Polio myelitis
(c) Plague (d) Kala-azar

Ans. (a)

Small-pox is an acute highly communicable viral disease. It is caused by virus named *Variola* virus. Now, it is eradicated from world including India by the mass polio vaccination campaign undertaken by government of India.

- 28** Which of the following pair of diseases is caused by virus? [CBSE AIPMT 1996]
- (a) Rabies, mumps
(b) Cholera, tuberculosis
(c) Typhoid, tetanus
(d) AIDS, syphilis

Ans. (a)

Rabies (hydrophobia) is caused by a virus named as rabies virus. It is a lethal disease. Mumps is an infectious disease causing fever, difficulty in opening the mouth and painful swelling of the parotid glands which lie just below the lobe of the ear. It is caused by a paramyxovirus.

- 29** In which one of the following pairs of diseases both are caused by viruses? [CBSE AIPMT 1996]
- (a) Tetanus and typhoid
(b) Whooping cough and sleeping sickness
(c) Syphilis and AIDS
(d) Measles and rabies

Ans. (d)

Measles and rabies are viral diseases.

Disease	Pathogen
Measles	<i>Rubeola</i> virus
Rabies	Rabies virus.

- 30** If all ponds and puddles are destroyed, the organism likely to be destroyed is [CBSE AIPMT 1993]

(a) *Leishmania* (b) *Trypanosoma*
(c) *Ascaris* (d) *Plasmodium*

Ans. (d)

Anopheles is the host of malarial parasite *Plasmodium* is known to occur most favourably in stagnant water, ditches, ponds, moist and damp places.

Destruction of all the ponds and puddles, i.e. the breeding places of larva and pupae will cause destruction in the number of *Anopheles* and *Plasmodium*.

- 31** Give the correct matching of causative agent/germ and disease [CBSE AIPMT 1993]

(a) *Anopheles* — malaria
(b) *Leishmania* — sleeping sickness
(c) *Glossina* — kala-azar
(d) *Wuchereria* — filariasis

Ans. (d)

Wuchereria bancrofti causes filariasis or elephantiasis.

- 32** The part of life cycle of malarial parasite *Plasmodium vivax*, that is passed in female *Anopheles* is [CBSE AIPMT 1992]

(a) sexual cycle
(b) pre-erythrocytic schisogony
(c) exo-erythrocytic schisogony
(d) post-erythrocytic schisogony

Ans. (a)

Sexual phase in the life cycle of *Plasmodium* occurs in the gut of mosquito. Sexual phase involves the gametocytes, megagametocytes (female) and microgametocytes (male) which reach the stomach of female *Anopheles* mosquito by sucking human blood.

- 33** Who discovered *Plasmodium* in RBCs of human beings? [CBSE AIPMT 1991]

(a) Ronald Ross (b) Mendel
(c) Laveran (d) Stephen

Ans. (c)

In 1880, **Charles Laveran** discovered *Plasmodium*, the causative agent of malaria in RBCs of human beings. In 1897, **Ronald Ross** discovered oocytes of *Plasmodium* in the stomach of mosquito.

- 34** Malignant tertian malarial is caused by [CBSE AIPMT 1991]

(a) *Plasmodium falciparum*
(b) *P. vivax*
(c) *P. ovale*
(d) *P. malariae*

Ans. (a)

Malignant tertian malaria is caused by the malarial parasite, *Plasmodium falciparum*, whereas, *P. vivax* causes tertian malaria and benign tertian malaria; *P. ovale* causes mild tertian malaria and *P. malariae* causes Quartan malaria.

- 35** In hot summer and cold winter, the number of malaria cases as well as *Anopheles* declines, reappearance of malaria in humid warm conditions is due to [CBSE AIPMT 1990]

(a) surviving malarial parasites in human carriers
(b) surviving sporozoites in surviving mosquitoes
(c) monkeys
(d) mosquito larvae in permanent waters

Ans. (d)

The reappearance of malaria in humid warm conditions is due to the mosquito larvae in permanent waters.

- 36** Amoebiasis is prevented by [CBSE AIPMT 1990]

(a) eating balanced food
(b) eating plenty of fruits
(c) drinking boiled water
(d) using mosquito nets

Ans. (c)

Amoebiasis or amoebic dysentery is caused by protozoan parasite *Entamoeba histolytica* that resides in the upper part of large intestine. It spreads through contaminated water and food containing adult form (trophozoite) or cyst of *Entamoeba*. Trophozoite damages intestinal wall by enzyme histolysin, reaches blood capillaries and feed on RBCs, bacteria, tissue debris, resulting in abdominal pain, acidic motions with mucus and blood. The disease can be prevented by drinking boiled and clean water and intake of fresh and hygienic food.

- 37** The vector for sleeping sickness is [CBSE AIPMT 1989]

(a) house fly (b) tse-tse fly
(c) sand fly (d) fruit fly

Ans. (b)

Trypanosoma gambiense is the causative agent of African sleeping sickness. Its primary host is man and the secondary (intermediate) host or vector is tse-tse fly (*Glossina palpalis*).

- 38** The infective state of malarial parasite *Plasmodium* that enters human body is [CBSE AIPMT 1989]

(a) merozoite
(b) sporozoite
(c) trophozoite
(d) minuta form

Ans. (b)

Sporozoites are small, spindle-shaped, uninucleate organisms present in the salivary glands of the mosquito. Sporozoites represent the infective stage, which along with saliva inoculates into the blood stream of human and undergo schizogony.

- 39** Malaria fever coincides with liberation of [CBSE AIPMT 1989]

(a) cryptomerozoites
(b) metacryptomerozoites
(c) merozoites
(d) trophozoites

Ans. (c)

Merozoites are the progeny of sporozoites, formed in the liver of human. These are produced several days after the initial infection, which enter the blood stream and infect erythrocytes.

TOPIC 2 Immunity

- 40** The Adenosine deaminase deficiency results into [NEET 2021]

(a) dysfunction of immune system
(b) Parkinson's disease
(c) digestive disorder
(d) Addison's disease

Ans. (a)

Adenosine deaminase is an enzyme. The deficiency of this particular enzyme results in severe combined immuno deficiency (SCID).

During the deficiency of adenosine deaminase the patient lacks functional T- lymphocytes and thus the immune system does not work properly.

- 41** The yellowish fluid 'colostrum' secreted by mammary glands of mother during the initial days of lactation has abundant antibodies (IgA) to protect the infant. This type of immunity is called as

[NEET (Oct.) 2020]

- (a) passive immunity
- (b) active immunity
- (c) acquired immunity
- (d) autoimmunity

Ans. (a)

Passive immunity is when readymade antibodies are directly given to protect the body against foreign agents.

For example, the yellowish fluid colostrum secreted by mother during the initial days of lactation has abundant antibodies (IgA) to protect the infant. Also the foetus receives some antibodies from their mother through the placenta during pregnancy.

- 42** Identify the wrong statement with reference to immunity.

[NEET (Sep.) 2020]

- (a) When readymade antibodies are directly given, it is called 'passive immunity'
- (b) Active immunity is quick and gives full response
- (c) Foetus receives some antibodies from mother, it is an example for passive immunity
- (d) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called 'active immunity'

Ans. (b)

The statement in option is (b) incorrect because active immunity is slow and takes time to give its full effective response in comparison to passive immunity where pre-formed antibodies are administered.

- 43** Humans have acquired immune system that produces antibodies to neutralise pathogens. Still innate immune system is present at the time of birth because it

[NEET (Odisha) 2019]

- (a) is very specific and uses different macrophages
- (b) produces memory cells for mounting fast secondary response
- (c) has natural killer cells which can phagocytose and destroy microbes
- (d) provides passive immunity

Ans. (c)

Innate immunity is non-specific type of defence that is present at the time of birth because it has natural killer cells which can phagocytose and destroy microbes (cellular barriers). Other forms of innate immunity are physical barriers, physiological and cytokine barriers.

- 44** Which of the following diseases is an autoimmune disorder?

[NEET (Odisha) 2019]

- (a) Myasthenia gravis
- (b) Arthritis
- (c) Osteoporosis
- (d) Gout

Ans. (a)

Myasthenia gravis is a chronic autoimmune neuromuscular disorder that causes weakness in the skeletal muscles. This is responsible for breathing and moving parts of the body including the arms and legs.

- 45** Concanavalin A is

[NEET (National) 2019]

- (a) an essential oil
- (b) a lectin
- (c) a pigment
- (d) an alkaloid

Ans. (b)

Concanavalin A is a lectin or a carbohydrate binding protein. It is a T-cell mitogen that can activate the immune system, recruit lymphocytes and elicit cytokine production. It can also induce programmed cell death via mitochondria-mediated apoptosis.

- 46** Which of the following immune responses is responsible for rejection of kidney graft?

[NEET (National) 2019]

- (a) Humoral immune response
- (b) Inflammatory immune response
- (c) Cell-mediated immune response
- (d) Auto-immune response

Ans. (c)

Cell-mediated immune response is responsible for the rejection of kidney graft. Cell-mediated immune response is conferred by sensitised T-lymphocytes and here, antibodies are not produced. T-cells confer a long term memory and they are able to discriminate between self and non-self. These cells sometimes consider graft as non-self and attack the same which causes its rejection.

- 47** Which of the following is not an autoimmune disease? [NEET 2018]

- (a) Alzheimer's disease
- (b) Rheumatoid arthritis
- (c) Psoriasis
- (d) Vitiligo

Ans. (a)

Alzheimer's disease is not an autoimmune disease. It is caused due to the destruction of vast number of neurons in the *Hippocampus*. It occurs due to a combination of genetic factors, environmental or lifestyle factors and the ageing process. There is loss of neurotransmitter acetylcholine. Individuals with this disease have trouble remembering recent events.

Rheumatoid arthritis, vitiligo and psoriasis all are autoimmune diseases. In **rheumatoid arthritis**, antibodies are produced against the synovial membrane and cartilage.

Vitiligo causes white patches on skin while **psoriasis** causes itch-skin.

- 48** MALT constitutes about per cent of the lymphoid tissue in human body. [NEET 2017]

- (a) 50%
- (b) 20%
- (c) 70%
- (d) 10%

Ans. (a)

MALT is mucosa associated lymphoid tissue located within the lining of the major tracts including respiratory, digestive and urinogenital tracts. It is nearly 50% of the total lymphoid tissue in the human body.

- 49** Transplantation of tissues/organs fails often due to non-acceptance by the patient's body. Which type of immune-response is responsible for such rejections? [NEET 2017]

- (a) Autoimmune response
- (b) Cell-mediated immune response
- (c) Hormonal immune response
- (d) Physiological immune response

Ans. (b)

Transplantation of tissue/organs may fail, when that tissue is rejected by the recipient's immune system leading to its destruction. Tissue rejection is a function of cell-mediated immune response that involves T-cells. These cells have the ability to distinguish between self and non-self. After the recognition of non-self tissue, the killer T-cells induces apoptosis of the target tissue.

- 50** In higher vertebrates, the immune system can distinguish self-cells and non-self. If this property is lost due to genetic abnormality and it attacks self-cells, then it leads to [NEET 2016, Phase I]

(a) graft rejection
(b) auto-immune disease
(c) active immunity
(d) allergic response

Ans. (b)

In auto-immune disease, the immune cells are unable to distinguish between self-cells and non-self cells and attack self-cells which may lead to auto-immune disorders like interstitial lung disease in humans.

- 51** Antivenom injection contains preformed antibodies while polio drops that are administered into the body contain [NEET 2016, Phase I]

(a) harvested antibodies
(b) gamma globulin
(c) attenuated pathogens
(d) activated pathogens

Ans. (c)

Oral polio vaccine consists of attenuated pathogens. Attenuated pathogens are living microorganisms or viruses cultured under adverse condition, leading to loss of their virulence. But these organisms have the ability to induce protective immunity. The oral vaccine of polio contains three live polio strains in attenuated forms.

- 52** If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidence? [CBSE AIPMT 2015]

(a) Fibrinogen in plasma
(b) Serum albumins
(c) Haemocytes
(d) Serum globulins

Ans. (d)

Globulin is one of the protein found in serum and it includes proteins, enzymes, complement and immunoglobulins (antibody).

That's why, if major deficiency of antibodies is suspected in a person, the globulins in serum is tested as the confirmatory evidence.

- 53** Grafted kidney may be rejected in a patient due to [CBSE AIPMT 2015]
(a) humoral immune response
(b) cell-mediated immune response
(c) passive immune response
(d) innate immune response

Ans. (b)

Grafted kidney may be rejected in a patient due to the cell-mediated immune response that is mediated by T-lymphocytes. The body is able to differentiate 'self' and 'non-self'. Therefore, tissue matching, blood group matching are essential before undertaking any graft/transplant and even after this the patient has to take immuno-suppressants all his/her life.

- 54** Which of the following immunoglobulins does constitute the largest percentage in human milk? [CBSE AIPMT 2015]
(a) IgD (b) IgM
(c) IgA (d) IgG

Ans. (c)

All types of immunoglobulin are found in human milk. Out of these secretory IgA, a type of immunoglobulin that protects the ears, nose, throat and the gastrointestinal tract, is found in largest amount.

- 55** The cell-mediated immunity inside the human body is carried out by [NEET 2013]
(a) T-lymphocytes (b) B-lymphocytes
(c) thrombocytes (d) erythrocytes

Ans. (a)

T-lymphocyte receptors can recognise only antigen that bound to cell membrane proteins. These lymphocytes mediate CMI (Cell Mediated Immunity). B-lymphocytes are the major effector molecules of humoral immunity. Erythrocytes are red blood cells. Thrombocytes or platelets secrete factors that are involved in vascular repair.

- 56** Which one of the following statements is correct with respect to immunity? [CBSE AIPMT 2012]
(a) Preformed antibodies need to be injected to treat the bite by a viper snake
(b) The antibodies against smallpox pathogen are produced by T-lymphocytes

(c) Antibodies are protein molecules, each of which has four light chains
(d) Rejection of a kidney graft is the function of B-lymphocytes

Ans. (a)

In artificially acquired passive immunity, preformed antibody in an immune serum of some other animal is introduced into the body. As the antivenom used to treat snake bites. In this case, the body does not produce any antibodies. Antibody is a protein molecule having two light chain and two heavy chain. B-cells recognise and bind antigens and may differentiate to memory cell or plasma cells (produce antibody). T-cells causes transplant rejection.

- 57** In which one of the following options the two examples are correctly matched with their particular type of immunity? [CBSE AIPMT 2012]

Examples	Type of immunity
(a) Polymorphonuclear leukocytes and monocytes	Cellular barriers
(b) Anti-tetanus and anti-snake bite injections	Active immunity
(c) Saliva in mouth and tears in eyes	Physical barriers
(d) Mucus coating of epithelium lining the urinogenital tract and the HCl in stomach	Physiological barriers

Ans. (a)

Phagocytosis is an important feature of cellular innate immunity, performed by cells called phagocytes that engulf or eat pathogens or foreign particles. Common examples of these phagocytes are monocytes, macrophages, neutrophil granulocytes (often referred to as polymorphonuclear leukocytes or PMN or PML, because of the varying shapes of nucleus), tissue dendritic cells, mast cells etc. Anti-tetanus and anti snake bite injections are examples of passive immunity.

- 58** Consider the following four statements (I-IV) regarding kidney transplant and select the two correct ones out of these.
I. Even if a kidney transplant is proper the recipient may need to

take immuno-suppressants for a long time.

- II. The cell-mediated immune response is responsible for the graft rejection.
- III. The B-lymphocytes are responsible for rejection of the graft.
- IV. The acceptance or rejection of a kidney transplant depends on specific interferons.

The two correct statements are
[CBSE AIPMT 2010]

- (a) II and III
- (b) III and IV
- (c) I and III
- (d) I and II

Ans. (d)

Both statements I and II are correct.

- 59** A person likely to develop tetanus is immunised by administering

- (a) dead germs [CBSE AIPMT 2009]
- (b) preformed antibodies
- (c) wide spectrum antibiotics
- (d) weakened germs

Ans. (b)

In passive immunity, the antibodies are produced in some other organisms (e.g. horse, rabbit, mouse) in response to the given antigen. These antibodies are then injected into the human body at the time of need. This is known as inoculation, e.g. persons infected by tetanus (*Clostridium tetani*), rabies virus and *Salmonella* the sufficient amount of antibodies, are given to enhance passive immunity at the time of need.

- 60** Globulins contained in human blood plasma are primarily involved in
[CBSE AIPMT 2009]

- (a) defence mechanisms of body
- (b) osmotic balance of body fluids
- (c) oxygen transport in the blood
- (d) clotting of blood

Ans. (a)

Globulins are soluble in salt solutions of strong acids and bases and insoluble in pure water and moderately concentrated salt solutions. These are coagulated by heat. Globulins contained in human blood plasma are primarily involved in defense mechanisms of the body. Some examples are i.e. Rabies immune globulin, RhO(D) immune globulin, specific immune globulin, tetanus immune globulin, etc.

- 61** The letter T in T-lymphocyte refers to
[CBSE AIPMT 2009]

- (a) thyroid
- (b) thalamus
- (c) tonsil
- (d) thymus

Ans. (d)

T-refers to thymus which is haemopoietic as well as an endocrine gland. Thymus is the 'seedbed' of thymic lymphocytes (T-lymphocytes). Certain stem cells, originating in yolk sac and liver in early embryo, but only in bone marrow in late embryo, migrate into the thymus and proliferate to form a large number of lymphocytes.

Thyroid is an endocrine gland.

Thalamus is the part of fore brain in vertebrate lies above the hypothalamus.

Tonsil is a mass of lymphoid tissue, several of which are situated at the back of the mouth and throat in higher vertebrates.

- 62** Use of anti-histamines and steroids give a quick relief from
[CBSE AIPMT 2009]

- (a) allergy
- (b) nausea
- (c) cough
- (d) headache

Ans. (a)

Allergy is the hypersensitive reaction of a person to some foreign substances coming in contact with or entering the body. The common allergens are dust, pollen mould, spores, fabricates, bacteria, etc. During allergic reaction, there is increased release of histamine from mast cells. Use of anti-histamines and steroids give a quick relief from allergy.

- 63** To which type of barriers under innate immunity, do the saliva in the mouth and the tears from the eyes, belong? [CBSE AIPMT 2008]

- (a) Cytokine barriers
- (b) Cellular barriers
- (c) Physiological barriers
- (d) Physical barriers

Ans. (c)

Innate immunity (inborn) is the resistance to infection, which an individual possesses by virtue of his/her genetic and constitutional make up. Thus it comprises all those defence elements with which an individual is born and, which are always available to protect a living body. Physiological barriers like body temperature, pH of the

body fluid, and various body secretions (saliva, tears) prevent growth of many disease causing micro-organisms. Skin is the physical barrier of the body. Its outer tough layer the stratum corneum prevents the entry of bacteria and viruses.

- 64** If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidence?
[CBSE AIPMT 2007]

- (a) Serum albumins
- (b) Serum globulins
- (c) Fibrinogen in plasma
- (d) Haemocytes

Ans. (b)

Antibodies also called immunoglobulins constitute the gamma globulin which are the part of blood proteins. These are secreted by activated B-cells or plasma cells.

- 65** Increased asthmatic attacks in certain seasons are related to
[CBSE AIPMT 2007]

- (a) hot and humid environment
- (b) eating fruits preserved in tin containers
- (c) inhalation of seasonal pollen
- (d) low temperature

Ans. (c)

Asthma is a respiratory disorder. It is caused by foreign allergens and dust particles present in the air passing through the respiratory system, the pollen grains present in air can cause asthmatic attacks in certain seasons as are produced in large number in that particular seasons.

- 66** What is true about T-lymphocytes in mammals? [CBSE AIPMT 2004]

- (a) They scavenge damaged cells and cellular debris
- (b) These are produced in thyroid
- (c) There are three main types—cytotoxic T-cells, helper T-cells and suppressor T-cells
- (d) These originate in lymphoid tissues

Ans. (c)

The function of T-cells is to provide immunity (cellular type) and not to scavenge damaged cells and cell debris. These are produced in bone marrow and get matured in thymus gland. Hence, the only true statement is that there are three types of T-cells, i.e. cytotoxic, helper and suppressor.

67 The term 'antibiotic' was coined by
[CBSE AIPMT 2003]

- (a) Selman Waksman
- (b) Alexander Fleming
- (c) Edward Jenner
- (d) Louis Pasteur

Ans. (a)

The term 'antibiotics' was first time used by **SA Waksman** in 1945. Antibiotics are the substances which are produced by microorganisms such as fungi or bacteria. These substances are harmful to the growth of other microorganisms, example of some of the antibiotics are penicillin, streptomycin, chloramphenicol, etc.

68 Interferons are synthesised in response to [CBSE AIPMT 2001]

- (a) *Mycoplasma*
- (b) bacteria
- (c) viruses
- (d) fungi

Ans. (c)

Cells infected by virus produce interferons (an antiviral protein) which is antiviral. It spreads to neighbouring cells and makes them resistant to virus infections by inhibiting viral growth.

69 Small proteins produced by vertebrate cells naturally in response to viral infections and which inhibit multiplication of viruses are called
[CBSE AIPMT 2000]

- (a) immunoglobulins
- (b) interferons
- (c) antitoxins
- (d) lipoproteins

Ans. (b)

Interferons (INFs) are a group of three vertebrate glycoproteins (α , β , γ). Out of these, two (α and β) are produced within viral infected cells. Interferon induces, among adjacent cells, as antiviral state by inducing synthesis of the enzymes which inhibit the viral production cycle. Thus, inhibiting multiplication of virus in the body.

70 If a person shows production of interferons in his body, the chances are that he has got an infection of [CBSE AIPMT 1997]

- (a) typhoid
- (b) measles
- (c) tetanus
- (d) malaria

Ans. (b)

Interferons are proteins produced by a cell infected by a virus and provide protection to other healthy cells against infection by viruses. Measles is also viral disease. It is caused by **paramyxovirus** (RNA virus). Interferon was discovered in 1957 by **Issacs** and **Lindenmann**.

Typhoid and tetanus are bacterial diseases and malaria is a protozoan disease.

71 Passive immunity was discovered by [CBSE AIPMT 1996]

- (a) Edward Jenner
- (b) Emil von Behring
- (c) Robert Koch
- (d) Louis Pasteur

Ans. (a)

Passive immunity was first discovered by Edward Jenner against chickenpox. In passive immunity readymade antibodies (γ -globulins) obtained from human or animal serum, who already had recovered from an infectious disease, are injected into human body to develop immunity.

It is used against measles, rubella, mumps, diphtheria, tetanus, snake venom, scarlet fever, rabies and *Salmonella* and many other bacterial infection.

72 Hypersensitivity to an allergen is associated with [CBSE AIPMT 1996]

- (a) aberrant functioning of the immune mechanism
- (b) increase in ambient temperature
- (c) age of the individual
- (d) food habits

Ans. (a)

Allergy is hypersensitivity or inappropriate over reaction or aberrant functioning of the immune system.

73 Which of the following diseases is due to an allergic reaction?
[CBSE AIPMT 1995]

- (a) Goitre
- (b) Skin cancer
- (c) Hay fever
- (d) Enteric fever

Ans. (c)

Allergy also known as hypersensitivity, is an inappropriate over-reaction of the immune system. Hay fever is an allergic reaction, antigens for such response are pollen grains, dust and SPM in the polluted air.

Symptoms of hay fever includes closure of bronchial tubes that results in difficulty in normal breathing, skin rashes and eosinophilia.

74 Cells involved in immune mechanism are [CBSE AIPMT 1993]

- (a) erythrocytes
- (b) lymphocytes
- (c) eosinophils
- (d) thrombocytes

Ans. (b)

Lymphocytes are agranulocytes and they play a key role in immunological reactions. Lymphocytes are of two types

- (i) B-lymphocytes-function in the form of immunity called antibody mediated immunity (humoral immunity).
- (ii) T-lymphocytes-function in cell-mediated immunity (cellular immunity).

75 Small proteins produced by vertebrate cells naturally in response to viral infections and which inhibit multiplication of viruses are called
[CBSE AIPMT 2000]

- (a) immunoglobulins
- (b) interferons
- (c) antitoxins
- (d) lipoproteins

Ans. (b)

Interferons (INFs) are a group of three vertebrate glycoproteins (α , β , γ). Out of these, two (α and β) are produced within virally infected cells. Interferon act as antiviral protein by inducing synthesis of the enzymes which inhibit the viral production cycle.

So, interferons are inhibitors of virus particles.

76 The antibodies are [CBSE AIPMT 1999]

- (a) germs
- (b) carbohydrates
- (c) proteins
- (d) lipids

Ans. (c)

Antibodies are glycoproteins and are secreted by mature vertebrate plasma cells which are modified form of B-cells.

These selectively bind to epitopes of antigens and clumping them (agglutination) prior to phagocytic engulfment.

77 In mammals, histamine is secreted by **[CBSE AIPMT 1998]**

- (a) fibroblasts (b) histocytes
(c) lymphocytes (d) mast cells

Ans. (d)

Histamine is a potent vasodilator formed by decarboxylation of the amino acid histidine and released by mast cells in response to appropriate antigens.

Mast cells are especially prevalent in the connective tissue of the skin, respiratory tract and in surrounding blood vessels.

78 Interferons are **[CBSE AIPMT 1996]**

- (a) antiviral proteins
(b) antibacterial proteins
(c) anticancer proteins
(d) complex proteins

Ans. (a)

Interferons (IFNs) are anti-viral, regulatory glycoproteins, produced in virus infected cells for defence. They are non-antigenic protein of molecular weight 20000 daltons; discovered by Issacs and Lindemann (1957). These IFNs induce formation of certain enzymes that suppress viral multiplication in host cell and protect host from further viral reinfection.

TOPIC 3

Cancer and AIDS

79 For effective treatment of the disease, early diagnosis and understanding its pathophysiology is very important. Which of the following molecular diagnostic technique is very useful for early detection? **[NEET 2021]**

- (a) Western Blotting Technique
(b) Southern Blotting Technique
(c) ELISA Technique
(d) Hybridisation Technique

Ans. (c)

ELISA stands for Enzyme Linked Immunosorbent Assay.

It is a technique to detect the presence of antigens in biological samples. It is a very effective molecular diagnostic technique used for early detection. In this technique the antibodies in the sample binds to the specific antigen for the disease which is to be detected.

There are different type of ELISA test, that includes

- Direct ELISA
Indirect ELISA
Sandwich ELISA

80 Which of the following statements is not true for cancer cells in relation to mutations? **[NEET 2016, Phase I]**

- (a) Mutations destroy telomerase inhibitor
(b) Mutations inactivate the cell control
(c) Mutations inhibit production of telomerase
(d) Mutations in proto-oncogenes accelerate the cell cycle

Ans. (c)

Cancerous cells have high telomerase activity. The maintenance of telomere stability is required for the long term proliferation of tumors. This makes telomerase a target not only for cancer diagnosis but also for the development of novel anti-cancer therapeutic agents, e.g. telomerase inhibitors are used in cancer treatment.

81 Which of the following is correct regarding AIDS causative agent HIV? **[NEET 2016, Phase II]**

- (a) HIV is enveloped virus containing one molecule of single-stranded RNA and one molecule of reverse transcriptase
(b) HIV is enveloped virus that contains two identical molecules of single-stranded RNA and two molecules of reverse transcriptase
(c) HIV is unenveloped retrovirus
(d) HIV does not escape but attacks the acquired immune response

Ans. (b)

Statement (b) is correct. The correct form of other statements are

- (a) HIV is a virus containing ssRNA and reverse transcriptase enzyme enveloped by protein coat.
(c) HIV is enveloped retrovirus.
(d) HIV escapes the immune cells and attacks helper T-cells of immune system.

82 At which stage of HIV infection does one usually show symptoms of AIDS? **[CBSE AIPMT 2014, 11]**

- (a) Within 15 days of sexual contact with an infected person

- (b) When the infected retro virus enters host cells
(c) When HIV damages large number of helper T-lymphocytes
(d) When the viral DNA is produced by reverse transcriptase

Ans. (c)

T-lymphocyte receptors can recognise only antigen that bound to cell membrane proteins. These lymphocytes mediate CMI (cell mediated immunity). B-lymphocytes are the major effector molecules of humoral immunity. Erythrocytes are red blood cells. Thrombocytes or platelets secrete factors, that are involved in vascular repair.

83 Which one of the following is not a property of cancerous cells, whereas the remaining three are? **[CBSE AIPMT 2012]**

- (a) They compete with normal cells for vital nutrients
(b) They do not remain confined in the area of formation
(c) They divide in an uncontrolled manner
(d) They show contact inhibition

Ans. (d)

Contact inhibition involves major histocompatibility complex and is the natural process of arresting cell growth when two or more cells come in contact with each other. It is a property of normal cells. Cancer cells divide in uncontrolled manner and do not show contact inhibition.

84 A certain patient is suspected to be suffering from acquired immuno deficiency syndrome. Which diagnostic technique will you recommend for its detection? **[CBSE AIPMT 2011]**

- (a) MRI (b) Ultra sound
(c) WIDAL (d) ELISA

Ans. (d)

ELISA (Enzyme Linked Immuno Sorbent Assay), also known as an Enzyme Immuno Assay (EIA), is a biochemical technique used mainly in immunology to detect the presence of an antibody or an antigen in a sample.

It is a useful tool for determining serum antibody concentrations (such as with the HIV test). The ELISA was the first screening test widely used for HIV because of its high sensitivity as it detects antibodies at very low concentrations.

85 Which one of the following statements is correct with respect to AIDS? [CBSE AIPMT 2010]

- (a) The HIV can be transmitted through eating food together with an infected person
- (b) Drug addicts are least susceptible to HIV infection
- (c) AIDS patients are being fully cured cent per cent with proper care and nutrition
- (d) The causative HIV retrovirus enters helper T-lymphocytes thus, reducing their numbers

Ans. (d)

In AIDS patients, the virus attacks on CD₄ + T - cells(helper T-lymphocytes responsible for the coordination of the entire immune system), infecting and killing them until none of them are left in blood. Without these crucial immune system cells, the body cannot fight against invading bacteria or viruses which leads to weaker immune system and gradually the body of the HIV positive persons become house of infections leading to multiple problems.

86 Which one of the following statements is correct? [CBSE AIPMT 2009]

- (a) Patients, who had undergone surgery are given cannabinoids to relieve pain
- (b) Benign tumours show the property of metastasis
- (c) Heroin accelerates body functions
- (d) Malignant tumours may exhibit metastasis

Ans. (d)

Malignant tumour first grows slowly. No symptoms are noticed. This stage is called the latent stage. The tumour later grows quickly. The cancer cells go beyond adjacent tissue and enter the blood and lymph. Once this happens, they migrate to many other sites in the body, where the cancer cells continue to divide. It is called as metastasis. Only malignant tumours are properly designated as cancer.

87 Carcinoma refers to [CBSE AIPMT 2003]

- (a) malignant tumours of the colon
- (b) benign tumours of the connective tissue
- (c) malignant tumours of the connective tissue
- (d) malignant tumours of the skin or mucous membrane

Ans. (d)

Carcinoma is a malignant or metastatic tumour. It can extend to the neighbouring cells, this process is called as metastasis. These tumours are generally located in epithelial tissue and glands.

e.g. Breast cancer, skin cancer, stomach cancer, lungs cancer, pancreas cancer, etc.

88 ELISA is used to detect viruses where the key reagent is [CBSE AIPMT 2003]

- (a) DNA probe
- (b) RNase
- (c) alkaline phosphatase
- (d) catalase

Ans. (c)

The Enzyme Linked Immuno Sorbent Assay (ELISA), also known as the Enzyme Immuno Assay (EIA) has become a widely used serological technique for, detection of AIDS in the blood serum of HIV infected person. The enzymes used for labelling in ELISA include horse radish peroxidase, alkaline phosphatase, β -galactosidase, lactoperoxidase, etc.

89 Cancerous cells can easily be destroyed by radiation due to [CBSE AIPMT 2002]

- (a) rapid cell division
- (b) lack of nutrition
- (c) fast mutation
- (d) lack of oxygen

Ans. (a)

The ability of radiations to kill cells is highest in the tissue with highest number of dividing cells. Tumour cells proliferate rapidly. Hence, tumours are killed more rapidly by radiations.

90 Reason of lung cancer is [CBSE AIPMT 2001]

- (a) coal mining
- (b) calcium fluoride
- (c) cement factory
- (d) bauxite mining

Ans. (c)

Cancer is an uncontrolled growth and division of certain body tissues. Lung cancer is a cancer of epithelial tissue of lungs. It is mainly (95%) caused by smoking and can be found in both male and female. It may also occur in the people working in cement factory.

91 Human Immunodeficiency Virus (HIV) has a protein coat and a genetic material which is [CBSE AIPMT 1998]

- (a) single stranded DNA
- (b) single stranded RNA
- (c) double stranded RNA
- (d) double stranded DNA

Ans. (b)

AIDS (Acquired Immunodeficiency Syndrome) was first reported in USA in 1981. It is caused by HIV (Human Immunodeficiency Virus). HIV is the member of retroviruses.

Later are so named because they contain an enzyme reverse transcriptase, which mediates the formation of DNA from RNA. The genetic material of HIV is single stranded RNA (ssRNA).

92 Hybridoma cells are [CBSE AIPMT 1999]

- (a) product of spore formation in bacteria
- (b) hybrid cells resulting from myeloma cells
- (c) nervous cells of frog
- (d) only cells having oncogenes

Ans. (b)

A myeloma is a type of cancer associated with abnormal production of irregular antibodies. It occurs in antibody-producing cells that have lost their normal control. Clones of the hybrid cell resulting from artificial fusion of a normal antibody producing B-cell with myeloma cell are called hybridomas.

93 Which of the following symptoms indicate radiation sickness? [CBSE AIPMT 1997]

- (a) Red and ulcerated skin
- (b) Nausea and anaemia
- (c) Nausea and loss of hair
- (d) Ulcerated skin, nausea and loss of hair

Ans. (d)

Even lower doses of radiations cause serious damages like skin burns, nausea, loss of hairs and nails, change in blood cell count, prolonged exposure causes formation of tumours, cancer. High dose (lethal radiation exposer) may cause instant death.

- 94** Which of the following will be curable in next two decades?
[CBSE AIPMT 1997]

(a) tuberculosis (b) cancer
(c) polio myelitis (d) None of these

Ans. (b)

Cancer may be curable in next two decades. The completion of the human genome is causing profound changes in thinking and direction of biomedical research. Cancer is caused by malfunctioning of genes, either through activation of cancer causing oncogenes (proto-oncogenes) or through inactivation of tumor suppressor genes. By comparing the active genes in the tumor to that of normal cells, the genes causing the cancer can be determined. Side by side there is a huge progress in the field of genetic engineering and biotechnology. All these aspects give us hope that cancer may be curable in next two decades.

- 95** Retroviruses are implicated as a cause for cancer in humans because they [CBSE AIPMT 1996]

(a) carry gene for reverse transcriptase
(b) may carry cellular protooncogenes in their genome
(c) may carry v-oncogenes in their genome
(d) carry single stranded RNA as their genetic material

Ans. (b)

Retroviruses are implicated as a cause of cancer in humans because they may carry cellular proto-oncogenes in their genome, when these proto-oncogenes gets converted into oncogenes due to some physical, chemical or biological agents they cause cancer.

TOPIC 4

Drugs and Alcohol Abuse

- 96** Identify the incorrect pair.
[NEET 2021]

(a) Alkaloids - Codeine
(b) Toxin - Abrin
(c) Lectins - Concanavalin-A
(d) Drugs - Ricin

Ans. (d)

Match pair in option (d) is incorrect and can be corrected as:
Ricin and abrin are potent biological

toxins that are derived from plant sources, e.g. castor beans. These toxins inhibit protein synthesis in body leading to cell death.

- 97** Coca alkaloid or cocaine is obtained from [NEET (Odisha) 2019]

(a) *Papaver somniferum*
(b) *Atropa belladonna*
(c) *Erythroxylum coca*
(d) *Datura*

Ans. (c)

Coca alkaloid or cocaine is obtained from coca plant *Erythroxylum coca*, native to South America. It interferes with the transport of the neurotransmitter dopamine.

- 98** Drug called 'Heroin' is synthesised by [NEET (National) 2019]

(a) acetylation of morphine
(b) glycosylation of morphine
(c) nitration of morphine
(d) methylation of morphine

Ans. (a)

Drug 'Heroin' is synthesised by the acetylation of morphine.

Chemically heroin is diacetylmorphine and commonly it is called smack. It is an opium derivative which is used as medicine. Excessive use of it causes addiction.

- 99** Which is the particular type of drug that is obtained from the plant whose one flowering branch is shown below? [CBSE AIPMT 2014]



(a) Hallucinogen
(b) Depressant
(c) Stimulant
(d) Pain-killer

Ans. (a)

The plant shown in the picture is *Datura* which produce natural hallucinogens. This kind of drug induce behavioural abnormalities by changing thoughts, feelings perceptions without any actual sensory stimulus.

- 100** Which one of the following fungi contains hallucinogens?
[CBSE AIPMT 2014]

(a) *Morchella esculenta*
(b) *Amanita muscaria*
(c) *Neurospora* sp.
(d) *Ustilago* sp.

Ans. (b)

Amanita muscaria, is a fungus which is known for its hallucinogenic properties.

- 101** Cirrhosis of liver is caused by the chronic intake of [CBSE AIPMT 2012]

(a) opium
(b) alcohol
(c) tobacco (chewing)
(d) cocaine

Ans. (b)

The chronic intake of alcohol may be fatal for the individual. On intake, a part of alcohol is changed to acetaldehyde which causes hangover. Acetaldehyde stimulates formation of fat which is deposited on artery walls (causing coronary ailments) and in the liver (causing fatty liver syndrome). Gradually, the liver hardens and dries up as its cells are replaced by fibrous tissue.

This kind of liver degeneration is called liver cirrhosis (Laennec's cirrhosis). Excessive use of alcohol may also lead liver failure, liver cell carcinoma, etc.

- 102** Select the correct statement from the ones given below.
[CBSE AIPMT 2010]

(a) Barbiturates when given to criminals make them tell the truth
(b) Morphine is often given to persons who have under gone surgery as a pain killer
(c) Chewing tobacco lowers blood pressure and heart rate
(d) Cocaine is given to patients after surgery as it stimulates recovery

Ans. (b)

Serturmer, a pharmacist isolated the active principle of opium in 1806 and named it morphine. Morphine is a phenanthrene opioid receptor, its main effect is binding to and activating the μ -opioid receptors in the central nervous system. In clinical settings, morphine exerts its principal pharmacological effect on the central nervous system and gastrointestinal tract. Its primary actions of therapeutic value are analgesic and sedation at low doses.

103 Which one of the following is the correct statement regarding the particular psychotropic drug specified? [CBSE AIPMT 2008]

- (a) Hashish causes alter thought perceptions and hallucinations
- (b) Opium stimulates nervous system and causes hallucinations
- (c) Morphine leads to delusions and disturbed emotions
- (d) Barbiturates cause relaxation and temporary euphoria

Ans. (a)

Charas is the dried resinous extract from the flowering tops and leaves of *Cannabis sativa*. In some countries, it is called hashish. It is a hallucinogen, which alters a person's thoughts, feelings and perceptions.

104 A person showing unpredictable moods, outbursts of emotion, quarrelsome behaviour and conflicts with others is suffering from [CBSE AIPMT 2006]

- (a) schizophrenia
- (b) Borderline Personality Disorder (BPD)
- (c) mood disorders
- (d) addictive disorders

Ans. (a)

Schizophrenia is a group of severe mental disorders that have common symptoms as hallucinations, delusions, blunted emotions, disordered thinking. It can be caused by excessive dopamine production, alternation of neuropeptide and decreased frontal lobe activities. Recovery is possible with regular use of chlorpromazine along with psychosocial therapy.

105 Which one of the following depresses brain activity and

produces feelings of calmness, relaxation and drowsiness?

[CBSE AIPMT 2005]

- (a) Valium (b) Morphine
- (c) Hashish (d) Amphetamines

Ans. (a)

Valium depresses brain activity and produces feeling of calmness, relaxation and drowsiness. It indirectly affects central nervous system on long term usage.

106 Which one of the following pairs is not correctly matched?

[CBSE AIPMT 2004]

- (a) *Streptomyces* – Antibiotic
- (b) *Serratia* – Drug addiction
- (c) *Spirulina* – Single cell protein
- (d) *Rhizobium* – Biofertiliser

Ans. (b)

Serratia is a harmful human pathogen which has been known to cause urinary tract infections, wound infections, pneumonia.

107 Which of the following is an opiate narcotic? [CBSE AIPMT 1997]

- (a) Barbiturates (b) Morphine
- (c) Amphetamines (d) LSD

Ans. (b)

Narcotics are a group of pain killers which includes heroin, morphine, codein and methadone. All of these drugs are derived from **opium**. Later is a gummy resin like substance found in unripe pods of poppy plants.

108 Nicotine acts as a stimulant, because it mimics the effect of [CBSE AIPMT 1995]

- (a) thyroxine (b) acetylcholine
- (c) testosterone (d) dopamine

Ans. (b)

Acetylcholine is rapidly acting excitatory small sized neurotransmitter. Nicotine and acetylcholine both have same receptors and so the both have the same effect

109 The alkaloid ajmalicine is obtained from [CBSE AIPMT 1995]

- (a) *Atropa* (b) Papaver
- (c) *Curcuma* (d) Sarpagandha

Ans. (d)

Ajmalicine is obtained from Sarpagandha. Its botanical name is *Rauwolfia serpentina* family—Apocyanaceae.

110 Opiate narcotic is [CBSE AIPMT 1993]

- (a) bhang (b) charas
- (c) heroin (d) nicotine

Ans. (c)

Opium is derived from unripe seed pods of the poppy plant *Papaver somniferum*. Opium has an analgesic effect and may also reduce anxiety and tension, lowers the blood pressure and breathing rate. Opium and its derivatives including **morphine, codeine and heroin** are among the drugs collectively known as **narcotic drugs**.

Narcotics induce addiction if used repeatedly and heroin is most dangerous narcotic.

111 Analgesic drugs [CBSE AIPMT 1990]

- (a) form tissues (b) relieve pain
- (c) relieve fatigue (d) cause pain

Ans. (b)

Analgesic drugs are those drugs which relieve us from pain. It acts on the peripheral and central nervous system which reversibly eliminate sensation of pain.