KINETICS
We Nurture The Future
IIT-JEE | Medical | Foundations

Why Do We Fall Ill?

OBJECTIVE TYPE QUESTIONS

Multiple Choice Questions (MCQs)

1. Vaccination
(a) develops resistance against the attack of a pathogen.
(b) can control every disease
(c) kills all the disease causing organisms in the area
(d) involves the use of antibodies.

2. The limitations that are normally confronted while treating an infectious disease is/are
(a) body functions are impaired and may never recover completely
(b) the patient is confined to bed for some time
(c) infected person serves as a potential source of spread of infectious disease to other persons
(d) all of these.

3. Given below are the pairs of disease and casual pathogen. Which one of the these is not a matching pair?
(a) Kala azar – *Leishmania*
(b) Sleeping sickness – *Trypanosoma*
(c) Malaria – *Salmonella*
(d) Chicken pox – *Varicella*

4. In case of snake bite, the doctor treats the patient with preformed antibodies. What type of immunity will be developed?
(a) Artificial passive acquired immunity
(b) Naturally active acquired immunity
(c) Artificial active acquired immunity
(d) Naturally passive acquired immunity

5. BCG is an effective vaccine to prevent
(a) tetanus
(b) tuberculosis
(c) diphtheria
(d) pertussis.

6. Full form of DPT is
(a) Dengue Pneumonia Typhoid
(b) Diphtheria Pertussis Tetanus
(c) Diphtheria Pertussis Typhoid
(d) Dengue Pneumonia Tetanus.

7. Match column I with column II and select the correct option from given codes.

	Column I		**Column II**
P.	TB	1.	Intestine
Q.	Hepatitis	2.	Lungs
R.	Cholera	3.	Brain
S.	Influenza	4.	Liver
T.	Fits	5.	Nasal chambers

(a) P-3, Q-1, R-5, S-2, T-4
(b) P-4, Q-2, R-5, S-1, T-3
(c) P-2, Q-4, R-1, S-5, T-3
(d) P-3, Q-1, R-4, S-2, T-5

8. Which of the following medicine is used to reduce the inflammatory reactions?
(a) Analgesics (b) Antipyretics
(c) Antihistamines (d) Antibiotics

9. The disease which occurs due to deficiency of vitamin C is
(a) goitre (b) beri-beri
(c) scurvy (d) cheilosis.

10. Community health programme includes all of these, except
(a) providing health education
(b) providing safe disposal of sewage
(c) providing clean drinking water
(d) providing only packaged food.

11. Select the correct statements.
(i) Food is the basic necessity for cell and tissue functions.
(ii) Mental well being is the basic necessity for proper functioning of cells and tissues.
(iii) Anything that prevents proper functioning of cells and tissues will lead to a lack of proper activity of the body.
(a) (i) and (iii) (b) (i) and (ii)
(c) (ii) and (iii) (d) (i), (ii) and (iii)

12. Health can be best defined as a state of
(a) being physically healthy
(b) not being diseased
(c) being physically healthy and disease-free
(d) being well enough to function well physically, mentally and socially.

13. Which of the following statements is/are correct about individual health?

(i) Public cleanliness is important for individual health.

(ii) Social environment is also important for individual health.

(iii) Physical environment is decided by our social environment.

(iv) Good economic conditions and jobs are needed for individual health.

(a) Only (i) (b) (ii) and (iv)

(c) Only (iii) (d) (i), (ii), (iii) and (iv)

14. Fill in the blanks and select the correct option.

Diseases that last only for very short periods of time are called ___(i)___ diseases. For example, ___(ii)___ lasts only for a few days. On the other hand, ailments that last for a long time, even as long as a lifetime are called ___(iii)___ diseases. For example ___(iv)___ , which is very common in some parts of India.

	(i)	(ii)	(iii)	(iv)
(a)	Acute	Diabetes	Chronic	Arthritis
(b)	Chronic	Common cold	Acute	Tuberculosis
(c)	Acute	Common cold	Chronic	Elephantiasis
(d)	Chronic	Cancer	Acute	Cough

15. Which of the following diseases is caused due to *Helicobacter pylori* ?

(a) Tuberculosis (b) Peptic ulcer

(c) Cancer (d) Elephantiasis

16. Who were awarded nobel prize for discovering the causative organism of peptic ulcer?

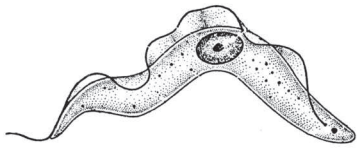
(a) Alexander Fleming and Darwin

(b) Barry Marshall and Leeuwenhoek

(c) Fleming and Edward Jenner

(d) Barry Marshall and Robin Warren

17. The given figure shows an organism responsible for causing the disease. Identify the disease.



(a) Kala-azar (b) Elephantiasis

(c) Sleeping sickness (d) AIDS

18. Select the correct statement(s).

(i) Worms multiply slowly in comparison to virus and bacteria.

(ii) Jaundice is a symptom of liver illness.

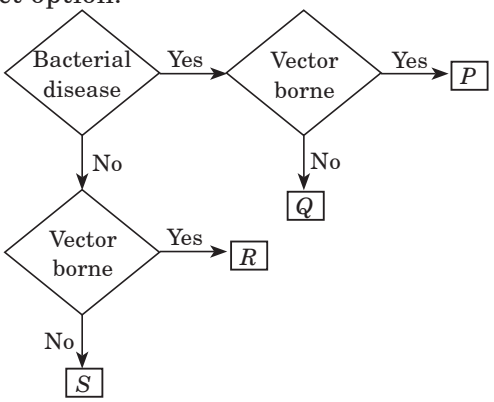
(iii) HIV attacks the musculoskeletal system of an individual.

(iv) Skin infections are commonly caused by different kinds of fungi.

(a) Only (i) (b) (i) and (ii)

(c) Only (iii) (d) (i), (ii) and (iv)

19. Refer to given flow chart and select the correct option.



(a) *P* can be common cold, aspergillosis or typhoid.

(b) *R* can be chikungunya, bubonic plague or malaria.

(c) *Q* can be tuberculosis, pneumonia or hepatitis.

(d) *S* can be AIDS, polio or measles.

20. Which disease is different among the following on the basis of mode of transmission?

(a) AIDS (b) Syphilis

(c) Gonorrhoea (d) Rabies

21. Choose the wrong statement.

(a) High blood pressure is caused by excessive weight and lack of exercise.

(b) Cancers can be caused by genetic abnormalities.

(c) Cholera and typhoid are water borne diseases.

(d) Acne is not caused by staphylococci.

22. You are aware of Polio Eradication Programme in your city. Children are vaccinated because

(a) vaccination kills the polio causing microorganisms.

(b) prevents the entry of polio causing organism.

(c) it creates immunity in the body.

(d) all of these.

23. Vectors can be defined as

(a) animals that carry the infecting agents from sick person to another healthy person

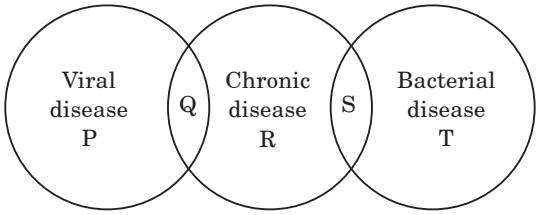
(b) microorganisms which cause many diseases

(c) infected person

(d) diseased plants.

24. Making anti-viral drugs is more difficult than making anti-bacterial medicines because
(a) viruses make use of host machinery
(b) viruses are on the border line of living and non-living
(c) viruses lack genetic material
(d) viruses have a protein coat.

25. Refer to the given Venn diagram.



Select the correct option for P, Q, R, S and T.
(a) P-Rhinitis, R-Mumps, T-Malaria
(b) Q-AIDS, S-Tuberculosis, R-Diabetes
(c) P-Dengue, Q-Chickungunya, S-Polio
(d) Q-Cancer, R-Diphtheria, S-Ringworm

26. 'Lock jaw' is another name of
(a) malaria (b) kala-azar
(c) tetanus (d) diphtheria.

27. Poliomyelitis virus, which causes infantile paralysis enters the body through the
(a) skin (b) mouth
(c) ears (d) eyes.

28. Which of the following is incorrect match?

	Disease	**Hormone involved**	**Level of hormone**
(a)	Cretinism	Thyroid hormone	Hyposecretion
(b)	Addison's disease	Aldosterone	Hyposecretion
(c)	Diabetes mellitus	Insulin	Hyposecretion
(d)	Myxoedema	Thyroid hormone	Hypersecretion

29. Which one is an acute disease?
(a) Diabetes (b) Tuberculosis
(c) Hypertension (d) Typhoid

30. Which type of diseases affect the body suddenly but, last for a short time?
(a) Acute disease (b) Chronic disease
(c) Congenital disease (d) Genetic disorder

31. Find from the following, a disease caused by helminth.
(a) Common cold (b) Chicken pox
(c) Elephantiasis (d) Malaria

32. Which of the following is correct regarding penicillin?
(a) It interferes in the biological pathway of bacteria.
(b) It is an antibiotic that can kill bacteria.
(c) Penicillin is obtained from a fungus.
(d) All of these

33. Which of the following cells in our body attacked by HIV virus .
(a) Red blood cells (b) White blood cells
(c) Liver cell (d) None of these

34. Uncontrolled cell division leads to
(a) normal growth (b) cancer
(c) whooping cough (d) gigantism.

35. Match the disease in column I with the appropriate items (pathogen/prevention/ treatment) in column II.

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

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

36. Which of the following correctly exemplifies acquisition of active immunity by a person?
(a) A person who has recovered from an attack of mumps, develops natural active immunity.
(b) When ready-made antibodies are directly injected into a person's body to protect him against foreign agents, then he acquires artificial active immunity.
(c) When a person is vaccinated for a disease then he acquires natural active immunity for that disease.
(d) When antibody is transferred from mother to the fetus through placenta then the developing baby acquires artificial active immunity.

37. Read the given sentences, each with one or two blanks and select the option that correctly fills any four of these.
(i) P causes ulcers in stomach and duodenum.
(ii) Q diseases last for only short period of time but are severe.

(iii) R diseases are anatomical or physiological abnormalities present since birth, *e.g.*, S

(iv) Malaria causing microbes are transmitted through bite of infected T and move to U and then red blood cells of humans.

(a) P-*Salmonella typhi*, R-Chronic, T-Sandfly, U-Brain cells

(b) Q-Acute, S-Kala azar, T-Tsetse fly, U-Pancreas

(c) P-*Helicobacter pylori*, R-Congenital, S-Cleft palate, U – Liver

(d) Q-Chronic, R-Acute, T-*Aedes* mosquito, U-Spleen

38. Severity of disease symptoms depends upon

(a) number of microbes (b) target organ

(c) both (a) and (b) (d) none of these.

39. Which is incorrect about malarial disease?

(a) It occurs due to bite of female *Anopheles* mosquito.

(b) Its causative organism is *Plasmodium*.

(c) It can not be controlled by any drug.

(d) Its symptoms include fever, paroxysms of chills etc.

40. Which of the statements listed below is true about common cold?

(a) Common cold is not contagious.

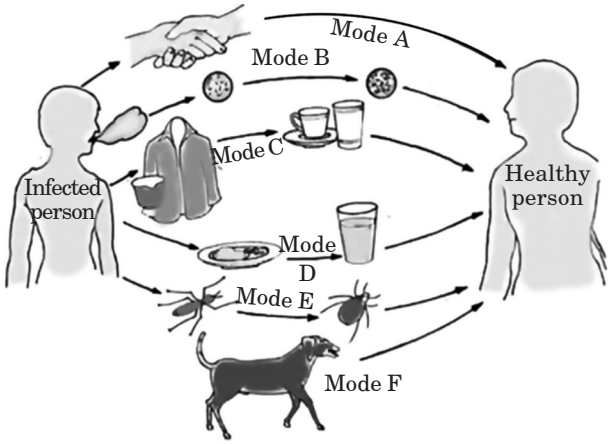
(b) The common cold virus does not have its own genetic material.

(c) Common cold usually takes two months to clear up.

(d) The common cold virus can leave the body through the mucus of infected people.

Case Based MCQs

Case I : Refer to the given figure and answer the following questions from 41 to 44.



41. Disease which can be transmitted by mode E is

(a) rabies (b) typhoid

(c) dengue (d) tuberculosis.

42. Read the following statement and select the correct statements.

(i) Mode D is the common method of transmission of diarrhoea.

(ii) Both the modes A and B are responsible for transmission of AIDS virus.

(iii) Hepatitis B is spread by the mode B only.

(iv) Rabies is transmitted by mode F.

(a) (ii) and (iii) (b) (i), (ii) and (iii)

(c) (i) and (iv) (d) (iii) and (iv)

43. Diseases that are transmitted by modes _____ are called vector borne diseases.

(a) B, C and D (b) A and B

(c) C and D (d) E and F

44. Which one of the following disease is not transmitted by mode E?

(a) Brain fever (b) Malaria

(c) Typhoid (d) Dengue

Case II : Read the passage given below and answer the following questions from 45 to 47.

Sukriti and Priya are good friends and study in class 1 of a reputed school. On a hot summer day, while they both were playing in the school playground, Priya felt uncomfortable and sat down. After some time she developed acute headache and high fever. Her legs stopped moving and she also felt some stiffness in her neck. Soon she became unconscious.

45. Identify the disease which Priya has contracted, along with its causative agent and mode of transmission.

	Disease	**Causative agent**	**Mode of transmission**
(a)	Malaria	Protozoan	Bite of infected *Anopheles*
(b)	Tuberculosis	Bacteria	Contaminated water
(c)	Polio	Virus	Faecal oral route
(d)	Diphtheria	Fungus	Sharing of clothes

46. What could be the probable reason for Sukriti not being affected by pathogen of this disease?

(a) Sukriti's immune system has already encountered the weakened pathogens and developed memory cells, which produce antibodies whenever pathogen enters her body.
(b) Sukriti had actually contracted the disease few months back and recovered, hence her immune system has developed memory cells, which prevent any subsequent pathogen attack.
(c) Sukriti is taking antibiotics regularly, which kill the pathogens entering her body and prevent the actual disease.
(d) Sukriti has received antibodies against the pathogen from her mother *via* placenta so she is immune to the pathogen of this disease by birth.

47. Which of the following is the most widely used vaccine for the prevention of disease contracted to Priya?
(a) OPV (b) MMR
(c) DPT (d) BCG

Case III : Read the passage given below and answer the following questions from 48 to 50.

X and Y are communicable diseases where X can spread from an infected person to a healthy person by direct contact between them whereas Y can spread from an infected person to healthy person through some intermediate agents.

48. Which of the following pathogen cannot be responsible for causing X?
(a) *Streptococcus pneumoniae*
(b) *Ascaris lumbricoides*
(c) *Plasmodium vivax*
(d) All of these.

49. Which one of the following is an example of '*X*'?
(a) Filariasis (b) Leprosy
(c) Cholera (d) Typhoid

50. Which of the following is an example of disease '*Y*'?
(a) Pneumonia (b) Marasmus
(c) Pellagra (d) Goitre

Assertion & Reasoning Based MCQs

For question numbers 51-60, a statement of assertion followed by a statement of reason is given. Choose the correct answer out of the following choices.

(a) Both assertion and reason are true, and reason is correct explanation of the assertion.
(b) Both assertion and reason are true, but reason is not the correct explanation of the assertion.
(c) Assertion is true, but reason is false.
(d) Assertion is false, but reason is true.

51. Assertion : Inflammatory response is produced in the body after some infections.
Reason : Inflammatory response is one type of defence mechanism.

52. Assertion : Majority of children in many parts of India are already immune to hepatitis A by the time they are five years old.
Reason : Children are exposed to the virus through water.

53. Assertion : Peptic ulcers cause acidity related pain and bleeding in the stomach.
Reason : Stress in the life causes peptic ulcers.

54. Assertion : Hepatitis is a viral infection of liver causing its inflammation.
Reason : Hepatitis is a contagious disease.

55. Assertion : Filarial worm is transmitted to humans by *Culex* mosquito.
Reason : *Culex* prefers to breed in fresh water.

56. Assertion : Its okay to sit near a person suffering from cold.
Reason : Cold is a communicable disease.

57. Assertion : Typhoid is an acute infectious disease caused by *Salmonella typhi* which is found in human intestine.
Reason : Typhoid is diagnosed by Widal test.

58. Assertion : Chicken pox is a mild disease however it leaves scars and marks.
Reason : Chicken pox results in rashes which appear first on stomach and chest, later spread on the face.

59. Assertion : Some diseases that attack in childhood do not attack again.
Reason : Memory cells play an important role.

60. Assertion : Dengue can be treated by taking antibiotics.
Reason : Antibiotics block the biochemical life processes of bacteria.

SUBJECTIVE TYPE QUESTIONS

Very Short Answer Type Questions (VSA)

1. Define health.

2. Name any two congenital diseases.

3. Knowledge of which disease helped Dr. Edward Jenner to develop the idea of vaccination.

4. Expand the terms AIDS and HIV.

5. Who discovered the vaccine for smallpox?

6. Give one local and one general effect of inflammation process.

7. Name any two diseases that occur due to mosquito bite.

8. Name two diseases which can be prevented by using vaccines.

9. Idea of vaccination was first given by whom?

10. Name the scientist who first discovered penicillin antibiotic. Can you name any other known antibiotic?

Short Answer Type Questions (SA-I)

11. Differentiate between acute and chronic diseases.

12. What are vectors? Give two examples.

13. Write any four factors that must be taken care of by an individual for keeping good health.

14. (a) What is inflammation?
(b) What are congenital diseases?

15. What is immunity? Name four diseases for which immunization vaccination are available.

16. Classify the following diseases as infectious or non-infectious.
(i) AIDS
(ii) Tuberculosis
(iii) Cholera
(iv) High blood pressure
(v) Heart disease
(vi) Pneumonia
(vii) Cancer

17. Explain mode of transmission of
(i) Diarrhoea
(ii) Hepatitis.

18. What is an antibiotic? Give two examples.

19. List any three preventive measures of AIDS disease.

20. Write a note on signs and symptoms of diseases.

Short Answer Type Questions (SA-II)

21. How will you distinguish between personal health and community health?

22. Explain symptoms of
(i) Tuberculosis of lungs
(ii) Malaria.

23. Describe the mechanism of action of antibiotics.

24. The symptoms of the disease will depend on the tissue/organ targeted by the infectious agent. Justify with three examples.

25. (a) State the method of transmission of each of the following diseases:
(i) Japanese encephalitis (ii) AIDS
(iii) Rabies (iv) Pneumonia
(b) Name the disease a person will get if the disease causing microbe targets the liver.

26. 'Disease-causing microbes are organ specific and tissue specific'. Explain with examples.

27. List any three ways of preventing the spread of air borne and water borne diseases.

28. 'In patients suffering from AIDS, even small cold can become pneumonia'. Explain the reason behind this.

29. "Prevention is better than cure". Justify the given statement.

30. 'A person suffered once from small pox cannot suffer from it again'. Give reason.

31. What are the principles of treatment of infectious diseases ?

32. Write short notes on following diseases.
(i) Pneumonia
(ii) Poliomyelitis

Long Answer Type Questions (LA)

33. Give short answers:
(a) During HIV infection, it is the other diseases which kill the patient rather than the HIV infection. Can you justify this statement?
(b) How does the immune system work against the microbes?
(c) What do signs and symptoms indicate if a person is suffering from any disease?

34. What are the ways through which infectious diseases generally spread in human communities?

35. Becoming exposed to or infected with an infectious microbe does not necessarily mean developing noticeable disease. Explain.

36. (i) "Tuberculosis is a highly infectious disease". Justify the statement.
(ii) Write the various measures that are to be taken to control TB.

37. (a) The signs and symptoms of a disease depend upon the tissues or organs the microbe targets. Explain giving any two examples.
(b) How does the immune system work against the microbes?

ANSWERS

OBJECTIVE TYPE QUESTIONS

1. (a) : Vaccination is a technique to develop immunity in individuals without infection. In vaccination, a preparation of antigenic protein of pathogens or weakened or dead pathogens are injected into a person who is required to be immuned.

2. (d)

3. (c) : Malaria is caused by *Plasmodium*.

4. (a) : Artificial passive acquired immunity develops when antibodies produced in other organism are injected into a person to counter act antigens, such as snake venom.

5. (b) : BCG vaccine develops immunity against tuberculosis.

6. (b) **7. (c)**

8. (c) : Antihistamines are used to reduce the inflammatory reactions because inflammation is generally caused by histamines.

9. (c) **10. (d)**

11. (a) : There are various specialized activities going on inside the cells or tissues. For all these activities, energy and raw materials are needed from outside the body. In other words, food is a necessity for cell and tissue functions. In other words, food is a necessity for cell and tissue functions. Anything that prevents proper functioning of cells and tissues will lead to a lack of proper activity of the body.

12. (d) : The World Health Organization (WHO), in 1948, has defined health as "a state of complete physical, mental and social well-being, and not merely an absence of disease, or infirmity."

13. (d) : The health of all organisms will depend on their surroundings or their environment. The environment includes the physical environment. We live in societies, our social environment therefore is an important factor for our individual health. Physical environment is decided by our social environment. We need food for health, and this food will have to be earned by doing work. For this, the opportunity to do work has to be available. Good economic conditions and jobs are therefore needed for individual health.

14. (c) **15. (b)**

16. (d) : *Helicobacter pylori* causes the disease peptic ulcer. It was discovered by Australian pathologist Robin Warren and young Australian clinical fellow, Barry Marshall. Both of them received the Nobel prize for physiology and medicine in 2005.

17. (c) : The given figure is of *Trypanosoma gambiense*. It causes sleeping sickness that spreads through the bite of tsetse fly.

18. (d) : HIV virus causes the disease, AIDS. HIV attacks the immune system of an individual and damages it. Because of HIV-AIDS, the body can no longer fight against disease or infection, which leads to death.

19. (d) : Variable *S* represents a disease that is neither caused by a bacterium nor is spread by a vector. It can be any disease caused by other pathogenic microbes like virus, protozoan, etc. Polio, AIDS and measles all are viral diseases and are not spread by vectors.

20. (d) : AIDS, syphilis and gonorrhoea are transmitted by sexual contact while rabies spreads by bite of an infected animal.

21. (d) : Staphylococci causes acne.

22. (c)

23. (a) : Vectors are living organisms that transmit infectious diseases from animals to humans or from humans to humans, without themselves being affected by the disease. Mosquitoes are the blood-sucking insects which ingest disease producing microorganisms during a blood meal from an infected host (human or animal) and later inject them into a new host during their subsequent blood meal. Mosquitoes are the vectors for a large number of diseases such as dengue, malaria, filariasis, brain fever, chikungunya, yellow fever, etc.

24. (a) : It is difficult to make antiviral drugs than anti-bacterial medicines. One reason is that viruses have few biochemical mechanisms of their own. They enter host's cells and use host's cell machinery for their life processes. This implies that there are relatively few virus-specific targets to aim at.

25. (b)

26. (c) : Tetanus is an acute and serious infection of the central nervous system caused by bacterial infection of open wounds. In tetanus, spasms of the jaw and laryngeal muscles may occur during the late stages, hence it is also called lock-jaw.

27. (b)

28. (d) : Myxoedema is caused by hyposecretion of thyroid hormone.

29. (d) : Diseases that last for only very short period of time are called acute diseases. Typhoid is an acute disease.

30. (a) : Acute disease lasts only for a short time duration such as common cold.

31. (c) : Elephantiasis (Filaria) is caused by a helminth (worm) *Wuchereria bancrofti* which attacks the blood and lymphatic system.

32. (d) **33. (b)**

34. (b) : Cancer arises from the abnormal and uncontrolled division of cells that then invade and destroy the surrounding tissues.

35. (b)

36. (a) : The immunity which is developed in response to a pathogenic attack is called natural active immunity.
The immunity which is induced by vaccination is called artificial active immunity. In both above cases the person develops antibodies against foreign antigen which enter naturally in first case and artificially in the second case.
When preformed antibodies are introduced in a person's body then it becomes the case of passive immunisation. This happens in case of antibodies transferred from mother to developing fetus or mother to her breast feeding infant through milk.

37. (c) : P –*Helicobacter pylori*
Q –Acute
R –Congenital
S –Cleft palate
T – *Anopheles*
U –Liver

38. (c) : The severity of the disease manifestations depends on the number of microbes present in the body. Smaller the number of microbes in the body, lesser are the symptoms of a disease. On the contrary, if microbes exist in large number in the body, disease can be severe and life-risking severity also depends upon the target organ.

39. (c) : Malaria can be cured by antimalarial drugs.

40. (d) : Common cold spreads through the mucus of the infected people during sneezing and coughing.

41. (c)

42. (c) : AIDS and Hepatitis B virus are transmitted through sexual contact and not by air while coughing or sneezing.

43. (d) : Vectors are living organisms which spread the pathogens from an infected person to a healthy person. Usually, a part of life cycle of the pathogen is passed in the body of the vector. Some animals like houseflies transfer the pathogen without taking them into their bodies. They are called carriers.

44. (c)

45. (c) : Priya was suffering from Polio disease. Polio is a viral disease, in which pathogen enters the body *via* alimentary

canal (faecal oral route) where it multiplies and reaches the nervous system through the blood stream. It causes inflammation of the nervous system. Stiffness of the neck is an important sign. Paralysis starts following the weakness of particular muscles. The attack of paralysis begins with high fever, headache, chilliness and pain all over the body.

46 (a) : In the case of Sukriti, vaccination is done against polio. In vaccination, a preparation of antigenic proteins of pathogens or inactivated/weakened pathogens (vaccine) are introduced in the body. These antigens generate the primary immune response and memory cells. When Sukriti is attacked by the same pathogen, the exiting memory cells recognise the antigen quickly and attack the invader with a massive production of lymphocytes and antibodies.

47. (a)

48. (d) : According to the given case, X and Y are communicable disease that spread through direct contact and indirect contact respectively. *Streptococcus pneumonia*, *Ascaris lumbricoides* and *Plasmodium vivax* are pathogens of pneumonia, ascariasis and malaria respectively. Pneumonia, ascariasis and malaria spreads through in direct contact air, food or water and mosquito respectively.

49. (b) : Leprosy is a communicable disease that spreads throughout contact.

50. (a)

51. (a) : Infection or tissue injury often results in redness and swelling, along with pains and production of heat that may result in fever. Such manifestation is localised and is known as inflammatory response. This response occurs due to release of chemical signals or alarm signals by the damaged mast cells. These responses inhibit and destroy the invading microorganisms. Thus, inflammatory response is said to be a defence mechanism.

52. (a) : Hepatitis virus, which cause jaundice, are transmitted through water. There is a vaccine for one of them, hepatitis A, in the market. But the majority of children in many parts of India are already immune to hepatitis A by the time they are five years old. This is because they are exposed to the virus through water.

53. (c) : Peptic ulcers cause acidity related pain and bleeding in the stomach and duodenum. Bacterium, *Helicobacter pylori* causes peptic ulcers.

54. (b) : Hepatitis is a viral infection of liver causing its inflammation. It is accompanied by loss of appetite, nausea, whitish stool, but orange brown urine and jaundice which occurs due to bilirubin released from damaged liver cell. Infectious hepatitis spreads from person to person by faecal or oral route. Contamination of water and food may cause epidemic. Serum hepatitis spreads by transfusion of contaminated blood.

55. (c) : The filarial worms cause a slowly developing chronic inflammation of the organs in which they live for many years, usually the lymphatic vessels of the lower limbs, and the disease is called filariasis. The pathogen spreads from one human being to another through mosquitoes like *Culex*. The parasite resides in lymph vessels, connective tissues and mesentery. In *Culex* and other mosquitoes, females are blood sucking while males suck juices of flowers and fruits. Female *Culex* carries filarial worm from one person to another. It prefers to breed in dirty water near human habitation.

56. (d) : It is not okay to sit near a person suffering from cold because cold is a communicable disease. The droplets containing the causative microbe of cold can spread through air when the person sneezes or coughs. If someone standing close by and breathes in these droplets, a person might get infected.

57. (b) : Typhoid is an acute infectious disease caused by *Salmonella typhi*. Typhoid spreads through food, milk and water contaminated with intestinal discharges either directly or through flies and faulty personal hygiene. Main symptoms are high fever, headache, diarrhoea, gastrointestinal disorders, etc. Typhoid is diagnosed by Widal test, an agglutination test for the presence of antibodies against the *Salmonella* organisms that cause typhoid fever.

58. (d) : Chicken pox is a mild but highly infectious disease causing slight fever, and a rash which undergoes changes into vesicles, pustules and finally a dark brown scab which falls off leaving no scar unlike smallpox, where scab leaves deep pits or scars known as pockmarks. In chicken pox, dew-drop like rash appears on stomach and chest first and spreads on face and the whole body later. Whereas, in small pox rash appears first on the face then on the rest of the body. It is more on the face and limbs and less on the trunk.

59. (a) : After the infection disappears as a result of antigen-antibody interaction, some of the specific lymphocytes remain in circulation as "memory cells" that give rise to more effector cells and memory cells in case of a second attack of antigens. The effector cells have a life of a few days only, and the memory cells live long, some even for whole life. That is

why the second attack of the infectious disease elicits quick response.

60. (d) : Dengue, a viral disease cannot be prevented by taking antibiotics because viruses do not have biochemical life processes of their own, so antibiotics are not effective against viral infections.

SUBJECTIVE TYPE QUESTIONS

1. Health is a state of body when all the organs and systems of body are functioning properly and a perfect balance is maintained between the environment and the body.

2. Haemophilia and colour blindness

3. Cowpox disease

4. AIDS – Acquired Immunodeficiency Syndrome, HIV – Human Immunodeficiency Virus

5. Edward Jenner

6. Local effect : Swelling or pain
General effect: Fever or headache

7. Dengue and malaria

8. Smallpox and polio

9. Dr. Edward Jenner

10. Sir Alexander Fleming, first discovered penicillin antibiotic. Other known antibiotic is streptomycin.

11.

	Acute disease	Chronic disease
(i)	An acute disease is one which comes rapidly and can be dangerous.	A chronic disease is one that lasts for a long time.
(ii)	It overs very soon, not have enough time to cause major effects on general health. Example – common cold.	It is treated in a long time and causes prolonged general poor health. Example – elephantiasis.

12. The organisms which carry the infectious agents from a sick person to another potential host are called vectors.
Example – Mosquito, insect, etc.

13. The four factors necessary for a good health are –
(i) Clean surrounding environment
(ii) Balanced diet
(iii) Good economic conditions
(iv) Social harmony

14. (a) An active immune system recruits many cells to the affected tissue to kill off the disease-causing microbes. This recruitment process is called inflammation.
(b) Congenital disease is the one that is present in an individual from birth. This may be due to genetic abnormality, metabolic disorders or malfunctioning of any body organ. These are permanent and are generally not easily curable. These are passed to the children from parents.

15. Immunity means capability of our immune system to destroy microbes. Our body produces special cells or immune cells which are specialised in destroying infecting microbes. If immune cells manage to kill off the disease causing microbe, we are safe from the disease. Tetanus, diphtheria, whooping cough and measles/polio can be prevented through immunization.

16. (i) Infectious (ii) Infectious
(iii) Infectious (iv) Non-infectious
(v) Non-infectious (vi) Infectious
(vii) Non-infectious

17. (i) Generally contaminated food, water, drinks, etc., and
(ii) (a) Hepatitis A spreads through contaminated food and water.
(b) Hepatitis B is transmitted by contact with infected person's secretions such as saliva, sweat, tears etc., and also blood.

18. Antibiotics are the chemicals secreted by microorganisms like fungi and bacteria that kill or hinder the growth of certain other kinds of microorganisms like bacteria, *e.g.*, penicillin and streptomycin.

19. (i) Use of disposable needles and syringes.
(ii) Use of blood (during blood transfusion) which has been screened for HIV.
(iii) Educating people about AIDS and its modes of transmission.

20. Symptoms are the manifestations of the presence of disease(s). Symptoms indicate that there is some abnormality in the body. For instance, we have headache or cough or loose motions or wound with pus. All these are symptoms of some disease(s). Headache may occur due to day's heavy work or problem of eye sight or blood pressure or it may occur due to number of diseases *e.g.*, malaria, typhoid, jaundice. Symptoms do not give exact cause of the disease. Signs provide information about the presence of particular disease. These are distinct for different diseases.

21. The differences between personal health and community health are as follows:

S. No.	Personal health	Community health
(i)	Personal health is a state of complete physical, mental and social well-being.	Community health comprises of improving, maintaining and protecting the health of the whole community.
(ii)	An individual can maintain his/her health by taking proper nutrition, drinking clean water, observing domestic and personal hygiene, adopting good habits and a healthy life-style, exercising regularly and relaxing etc.	Community health can be maintained by providing health, education, maintaining proper hygienic and sanitary conditions by proper disposal of sewage, providing healthcare services, providing safe drinking water etc.

22. (i) Fever and cough, blood-containing sputum, pain in the chest and loss of weight.

(ii) The attack of malaria is preceded by tiredness, headache, muscular pain, nausea and even vomiting. Malarial infection is characterised by paroxysms of chills, fever, sweating and by anaemia, enlargement of liver and spleen, and a chronic relapsing course.

23. Antibiotics commonly block biochemical pathways important for bacteria. Many bacteria make a cell wall to protect themselves. The antibiotic penicillin blocks the biochemical processes that build the cell wall. Consequently, the growing bacteria become unable to make cell walls and die easily.

24. (i) When lungs are targeted, the symptoms will be breathlessness, cough etc.

(ii) When liver is affected, there is jaundice.

(iii) When brain is affected, the patient shows headache, unconsciousness, fits etc.

25. (a) (i) Japanese encephalitis – Mosquito

(ii) AIDS – Sexual contact, blood transfusion

(iii) Rabies – Animal bite

(iv) Pneumonia – Air, water

(b) Jaundice

26. Human body has a number of organs, tissues and systems. Every pathogen has developed adaptation to infect a particular organ, tissue or system. In some cases, the infected organ or tissue specificity depends upon the portal of entry while in others it is not so. Pathogenicity or severity of harm depends upon the tissue destroyed and the release of toxins by the parasites. The microorganisms enter the body through various routes. If they enter through nose, they are likely to go into the lungs and cause respiratory disorders like tuberculosis or pneumonia. If they enter through the mouth, they pass into digestive tract and may cause typhoid, diarrhoea, helminth infection, etc. Some microbes like viruses reach liver and cause jaundice. However, it is not necessary that the infectious agent reaches a particular organ depending upon route of entry.

27. The ways of preventing the spread of air borne diseases are:

(i) Avoiding direct contact with an infected person.

(ii) Not sharing articles used by infected persons.

(iii) Use of mask/gloves/handkerchief.

The ways of preventing the spread of water borne diseases are:

(i) Providing safe drinking water.

(ii) Preventing contamination of drinking water.

(iii) Providing proper sanitation facilities.

28. AIDS is a disorder of immune system of the body. It is caused by retrovirus-HIV (human immunodeficiency virus). This virus weakens the human body's immune system, *i.e.*, self defence mechanism. As AIDS virus reduces the natural self-defence mechanism of the human body, the latter becomes prone to several other infections. Thus, a person suffering from AIDS becomes sick frequently.

29. Prevention is better than cure because:

(i) Once someone has a disease, their body functions are damaged. Sometimes they are never recovered completely.

(ii) Treatment will take time that means the patient is likely to be bedridden for sometime even if given proper treatment.

(iii) The person suffering from an infectious disease can serve as the source to spread the disease to other persons.

For the above reasons, it is clear that prevention of diseases is better than their cure.

30. A person suffered once from small pox cannot suffer from it again. This is because when the immune system of person's body first comes across an infectious organism like a virus causing small pox, it responds against virus and then remembers it specifically. When next time that particular

microbe or its close relatives enter the body, the immune system of the body responds with the pathogen even with greater vigour. This eliminates the infection more quickly than the first time and thus, we do not suffer with the same disease again.

31. There are two ways to treat an infectious (communicable) diseases. These are–

(i) To reduce the effects of the disease : It can be done by providing symptomatic treatment. We can provide treatment that will reduce the symptoms. For instance, we can take medicines that bring down fever, reduce pain or loose motions. We can also have bed rest to conserve our energy. These steps will enable us to focus on healing. To cure the disease, we need to kill the microbes.

(ii) To kill the cause of the disease, *i.e.*, pathogens: The most common method to kill disease-causing microbes is to use medicines that kill microbes. The disease-causing microbes are classified into different groups such as viruses, bacteria, fungi and protozoans. Each of these groups of microbes have some essential biochemical life processes which are specific to that group and not shared with the other groups. Our cells have different pathways than the ones used by these microbe groups. Therefore, a drug that blocks, for example, the bacterial biochemical pathway without affecting our own. Similarly, there are drugs that kill protozoans, *e.g.*, malarial parasite.

32. (i) Pneumonia is caused by the pathogen *Streptococcus pneumoniae* and *Haemophilus influenzae.* Symptoms are cough, fever, pain in the lungs.

Mode of transmission/ Incubation period – Direct contact / 1 - 3 days

Control measures/Treatment – PCV13 vaccine /Erythromycin, tetracycline

(ii) Poliomyelitis is caused by the pathogen Polio virus.

Symptoms are stiffness of neck, paralysis of skeletal muscles, fever, headache, pain.

Mode of transmission/ Incubation period – Contaminated food and water/ 7-14 days

Prevention – Avoiding contaminated food and water. Salk vaccine and OPV vaccine available.

33. (a) In HIV infection, virus does not kill the person but virus affects the immune system, which consists of B-cells and T-cells. Virus generally affects the T-cell or helper T-cells. This makes the immune cells less efficient to fight against other diseases such as common cold and diarrhoea and ultimately kills the person suffering from AIDS.

(b) The patient's immune system becomes activated in response to an infection. Activated body's immune system starts recruiting many cells to the affected tissue to kill the disease-causing microbes. This recruitment process of the active immune system is called inflammation. The inflammation results in some local effects such as swelling and pain and general effects such as fever.

(c) Symptoms indicate that there may be a disease, but don't indicate what the disease is. Sign of a disease is a definite indication of the presence of a particular disease. Physicians get laboratory test done to pinpoint the disease.

34. The ways through which infectious diseases spread are:

(a) Direct transmission : The pathogens are transmitted from an infected person to a healthy person directly without an intermediate agent. It occurs in the following ways:

(i) Physical contact with infected person : The pathogens of diseases like chicken pox, ringworm, etc. are spread through physical contact with infected person or through articles of use. Such diseases are called contagious diseases.

(ii) Sexual contact : Few infectious diseases such as syphilis, gonorrhoea (both caused by bacteria) and AIDS (caused by virus) are transmitted by sexual contact from one partner to the other.

(iii) Contact with soil : Many pathogens can enter the human body from soil through injuries (*e.g.*, tetanus).

(iv) Animal bites : Communicable diseases can also spread through the animal bites. For example, rabies virus enters the human body by the bite of rabid dog or monkey to cause rabies.

(v) Transplacental transmission : The diseases like AIDS, German measles and syphilis can also be transmitted from infected mother to the foetus through placenta.

(b) Indirect transmission : It involves spread of pathogens of some diseases through some intermediate agents. Indirect transmission occurs in the following ways:

(i) Through air : Infectious microbes that cause common cold, tuberculosis, pneumonia, etc., can spread through air from infected persons on sneezing, coughing or spitting.

(ii) Through contaminated food and water : Cholera, hepatitis B, diarrhoea, ascariasis, etc., are some infectious gut diseases which are transmitted through contaminated food and water. Contamination comes from excreta of the infected person mixing up with drinking water and food directly or indirectly (through flies).

(iii) Vectors : They are living organisms which spread the pathogens from an infected person to healthy person. *E.g.*, Female *Anopheles* spreads malaria, *Culex* spreads filaria, etc.

(iv) Fomite borne : Articles coming in contact with infected persons also become sources of infection to healthy person(s), *e.g.*, door handles, taps, utensils, garments and currency.

35. Microbes of different diseases are always present in our surrounding environment and we are also prone to coming in contact with persons suffering from infectious diseases directly or indirectly. But, because of strong immune system and presence of antibodies against specific diseases we do not necessarily develop that disease. Immune system of our body fights back the pathogens entering the body and most often successfully removes them. In this way our body remains protected from diseases. Antibodies that fight pathogens may develop in natural way or may be produced inside body through vaccination.

36. (i) Tuberculosis is caused by bacterium, *Mycobacterium tuberculosis*. It is a highly infectious disease. The bacterium affects the lungs, lymphnodes, bones and joints. The bacterium damages tissues and releases a toxin called tuberculin which produces the disease.

Infection spreads by tiny droplets of sputum released by the infected person by sneezing, coughing or spitting directly. Man may also get infection indirectly by taking contaminated milk of cow having bovine T.B.

Symptoms of pulmonary (lungs) tuberculosis are fever, cough, blood containing sputum, pain in the chest and loss of weight, excessive fatigue, failure of appetite, slight rise of temperature in the evening, hoarseness of throat, night sweating and rapid pulse.

Adequate rest, rehabilitation, diet are useful in controlling the disease.

(ii) Preventive measures are : good nourishment, immunization with BCG vaccine, pasteurisation of milk and isolation of T.B. patients.

37. (a) The signs and symptoms of a disease will depend upon the tissue or organ which the microbe targets. If the brain is the target, we will observe severe headache, vomiting, fits or unconsciousness. If the lungs are the target, the symptoms will be cough and breathlessness. When the liver is targeted there will be jaundice. If the lymph nodes are targeted, the lymphocyte production may go down. If alimentary canal is targeted by the worms, loss of appetite and abdominal pain may take place.

(b) Most of these common effects of infection depend upon the fact that the patient's immune system becomes activated in response to an infection. Activated body's immune system starts recruiting many cells to the affected tissue to kill the disease-causing microbes. This recruitment process of the active immune system is called inflammation. The inflammation results in some local effects such as swelling and pain and general effects such as fever. Immune system also produces antibodies against specific antigens.

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