

# Human Health and Diseases

## 8.1 Common Diseases in Humans

- The infectious stage of *Plasmodium* that enters the human body is
  - Trophozoites
  - Sporozoites
  - Female gametocytes
  - Male gametocytes
 (NEET 2020)
- Match the following diseases with the causative organism and select the correct option.
 

Column-I	Column-II
A. Typhoid	(i) <i>Wuchereria</i>
B. Pneumonia	(ii) <i>Plasmodium</i>
C. Filariasis	(iii) <i>Salmonella</i>
D. Malaria	(iv) <i>Haemophilus</i>

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

 (NEET 2020)
- Identify the correct pair representing the causative agent of typhoid fever and the confirmatory test for typhoid.
  - Salmonella typhi* / Widal test
  - Plasmodium vivax* / UTI test
  - Streptococcus pneumoniae* / Widal test
  - Salmonella typhi* / Anthrone test
 (NEET 2019)
- In which disease does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels?
  - Elephantiasis
  - Ascariasis
  - Ringworm disease
  - Amoebiasis
 (NEET 2018)
- Which of the following sets of diseases is caused by bacteria?
  - Cholera and tetanus
  - Typhoid and smallpox
  - Tetanus and mumps
  - Herpes and influenza
 (NEET-II 2016)
- Which of the following diseases is caused by a protozoan?
  - Babesiosis
  - Blastomycosis
  - Syphilis
  - Influenza
 (2015)
- Match each disease with its correct type of vaccine.
 

Column I	Column II
A. Tuberculosis	(i) Harmless virus
B. Whooping cough	(ii) Inactivated toxin
C. Diphtheria	(iii) Killed bacteria
D. Polio	(iv) Harmless bacteria

  
  - A-(iv), B-(iii), C-(ii), D-(i)
  - A-(i), B-(ii), C-(iv), D-(iii)
  - A-(ii), B-(i), C-(iii), D-(iv)
  - A-(iii), B-(ii), C-(iv), D-(i)
 (2015 Cancelled)
- The active form of *Entamoeba histolytica* feeds upon
  - food in intestine
  - blood only
  - erythrocytes, mucosa and submucosa of colon
  - mucosa and submucosa of colon only.
 (2015 Cancelled)
- Infection of *Ascaris* usually occurs by
  - Tse-tse fly
  - mosquito bite
  - drinking water containing eggs of *Ascaris*
  - eating imperfectly cooked pork.
 (NEET 2013)
- Identify the site where *Wuchereria bancrofti* is normally found in human body.
  - Muscles of the legs
  - Blood vessels of the thigh region
  - Skin between the fingers
  - Lymphatic vessels of the lower limbs
 (Karnataka NEET 2013)
- Motile zygote of *Plasmodium* occurs in
  - gut of female *Anopheles*
  - salivary glands of *Anopheles*
  - human RBCs
  - human liver.
 (2012)
- Widal test is carried out to test
  - malaria
  - diabetes mellitus
  - HIV/AIDS
  - typhoid fever.
 (2012)
- Common cold differs from pneumonia in that
  - 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. (2012)
14. Where will you look for the sporozoites of the malarial parasite?
- (a) Saliva of infected female *Anopheles* mosquito
- (b) Red blood corpuscles of human suffering from malaria
- (c) Spleen of infected humans
- (d) Salivary glands of freshly moulted female *Anopheles* mosquito (2011)
15. Which one of the following options gives the correct match of a disease with its causative organism and mode of infection?
- | Disease           | Causative organism              | Mode of infection                                   |
|-------------------|---------------------------------|---|
| (a) Typhoid       | <i>Salmonella typhi</i>         | With inspired air                                   |
| (b) Pneumonia     | <i>Streptococcus pneumoniae</i> | Droplet infection                                   |
| (c) Elephantiasis | <i>Wuchereria bancrofti</i>     | With infected water and food                        |
| (d) Malaria       | <i>Plasmodium vivax</i>         | Bite of male <i>Anopheles</i> mosquito (Mains 2011) |
16. Common cold is not cured by antibiotics because it is
- (a) caused by a virus
- (b) caused by a Gram-positive bacterium
- (c) caused by a Gram-negative bacterium
- (d) not an infectious disease. (Mains 2011)
17. Ringworm in humans is caused by
- (a) bacteria (b) fungi
- (c) nematodes (d) viruses. (2010)
18. Widal test is used for the diagnosis of
- (a) malaria (b) pneumonia
- (c) tuberculosis (d) typhoid. (2010)
19. A person suffering from a disease caused by *Plasmodium*, experiences recurring chill and fever at the time when
- (a) the sporozoites released from RBCs are being rapidly killed and broken down inside spleen
- (b) the trophozoites reach maximum growth and give out certain toxins
- (c) the parasite after its rapid multiplication inside RBCs ruptures them, releasing the stage to enter fresh RBCs
- (d) the microgametocytes and megagametocytes are being destroyed by the WBCs. (Mains 2010)
20. Which of the following is a pair of viral diseases?
- (a) Common cold, AIDS
- (b) Dysentery, common cold
- (c) Typhoid, tuberculosis
- (d) Ringworm, AIDS (2009)
21. Match the disease in column I with the appropriate items (pathogen / prevention / treatment) in column II.
- | 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 – (ii), B – (i), C – (iii), 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) (2008)
22. Which one of the following is not correctly matched?
- (a) *Glossina palpalis* - Sleeping sickness
- (b) *Culex pipiens* - Filariasis
- (c) *Aedes aegypti* - Dengue fever
- (d) *Anopheles culicifacies* - Leishmaniasis (2004)
23. *Salmonella* is related with
- (a) typhoid (b) polio
- (c) T.B. (d) tetanus. (2001)
24. Which is the most infectious disease?
- (a) Hepatitis-B (b) AIDS
- (c) Amoebiasis (d) Malaria (2001)
25. Which is showing accurate pairing?
- (a) Syphilis - *Treponema pallidum*
- (b) AIDS - *Bacillus conjugalis*
- (c) Gonorrhoea - *Leishmania donovani*
- (d) Typhoid - *Mycobacterium leprae* (2000)
26. Saline solution is given to patients of cholera because
- (a) Na<sup>+</sup> prevents water loss from body
- (b) NaCl function as regulatory material
- (c) NaCl produces energy
- (d) NaCl is antibacterial. (2000)
27. Botulism caused by *Clostridium botulinum* affects the
- (a) lymph gland
- (b) central nervous system
- (c) spleen
- (d) intestine. (1998)

28. Typhoid fever is caused by  
 (a) *Shigella* (b) *Escherichia*  
 (c) *Giardia* (d) *Salmonella*. (1998)
29. Diphtheria is caused by  
 (a) nematodes (b) bacteria  
 (c) virus (d) none of these. (1997)
30. Which of the following diseases is now considered completely eradicated from India?  
 (a) Small pox (b) Poliomyelitis  
 (c) Plague (d) Kala-azar (1997)
31. Which of the following symptoms indicate red sickness?  
 (a) Nausea and loss of hair  
 (b) Ulcerated skin, nausea and loss of hair  
 (c) Red and ulcerated skin  
 (d) Nausea and anaemia (1997)
32. Which of the following pair of diseases is caused by virus?  
 (a) Rabies, mumps (b) Cholera, tuberculosis  
 (c) Typhoid, tetanus (d) AIDS, syphilis (1996)
33. Which one of the following pairs is not correctly matched?  
 (a) Syphilis – *Trichuris trichiura*  
 (b) Sleeping sickness – *Trypanosoma gambiense*  
 (c) Dengue fever – Arbovirus  
 (d) Plague – *Yersinia pestis* (1995)
34. Which of the following causes plague?  
 (a) *Trichinella spiralis*  
 (b) *Salmonella typhimurium*  
 (c) *Yersinia pestis*  
 (d) *Leishmania donovani* (1995)
35. Which one of the following does correctly match a sexually transmitted disease with its pathogen?  
 (a) Syphilis-*Treponema pallidum*  
 (b) Gonorrhoea-*Entamoeba histolytica*  
 (c) Urethritis-*Bacillus anthracis*  
 (d) Softsore-*Bacillus brevis* (1994)
36. Schizont stage of *Plasmodium* occurs in human  
 (a) erythrocytes (b) liver cells  
 (c) erythrocytes and liver cells  
 (d) erythrocytes, liver cells and spleen cells. (1993)
37. If all ponds and puddles are destroyed, the organism likely to be destroyed is  
 (a) *Leishmania* (b) *Trypanosoma*  
 (c) *Ascaris* (d) *Plasmodium*. (1993)
38. Give the correct matching of causative agent/germ and disease.  
 (a) *Anopheles* – Malaria  
 (b) *Leishmania* – Sleeping sickness  
 (c) *Glossina* – Kala-azar  
 (d) *Wuchereria* – Filariasis (1993)
39. The part of life cycle of malarial parasite *Plasmodium vivax*, that is passed in female *Anopheles* is  
 (a) sexual cycle  
 (b) pre-erythrocytic schizogony  
 (c) exoerythrocytic schizogony  
 (d) post-erythrocytic schizogony. (1992)
40. African sleeping sickness is due to  
 (a) *Plasmodium vivax* transmitted by tse-tse fly  
 (b) *Trypanosoma lewisi* transmitted by bed bug  
 (c) *Trypanosoma gambiense* transmitted by *Glossina palpalis*  
 (d) *Entamoeba gingivalis* spread by housefly. (1991)
41. Malignant tertian malarial parasite, belongs to class  
 (a) *Plasmodium falciparum*  
 (b) *P. vivax*  
 (c) *P. ovale*  
 (d) *P. malariae*. (1991)
42. Who discovered *Plasmodium* in RBC of human beings?  
 (a) Ronald Ross (b) Mendel  
 (c) Laveran (d) Stephens (1991)
43. The infective stage of malarial parasite, *Plasmodium* that enters human body is  
 (a) merozoite (b) sporozoite  
 (c) trophozoite (d) minuta form. (1990)
44. A bite of tse-tse fly may pass to humans  
 (a) *Leishmania donovani*  
 (b) *Trypanosoma gambiense*  
 (c) *Entamoeba histolytica*  
 (d) *Plasmodium vivax*. (1989)
45. Malaria fever coincides with liberation of  
 (a) cryptomerzoties  
 (b) metacryptomerzoties  
 (c) merozoites  
 (d) trophozoites. (1989)
46. The vector for sleeping sickness is  
 (a) housefly (b) tse-tse fly  
 (c) sandfly (d) fruit fly. (1989)
47. The causal organism for African sleeping sickness is  
 (a) *Trypanosoma cruzi* (b) *T. rhodesiense*  
 (c) *T. tangela* (d) *T. gambiense*. (1989)

## 8.2 Immunity

48. Identify the wrong statement with reference to immunity.  
 (a) When exposed to antigen (living or dead) antibodies are produced in the host's body. It is called "Active immunity".  
 (b) When ready-made antibodies are directly given, it is called "Passive immunity".



- (c) Active immunity is quick and gives full response.  
(d) Fetus receives some antibodies from mother, it is an example for passive immunity. (NEET 2020)
49. Which of the following immune responses is responsible for rejection of kidney graft?  
(a) Cell-mediated immune response  
(b) Auto-immune response  
(c) Humoral immune response  
(d) Inflammatory immune response (NEET 2019)
50. Colostrum, the yellowish fluid, secreted by mother during the initial days of lactation is very essential to impart immunity to the new born infants because it contains  
(a) immunoglobulin A (b) natural killer cells  
(c) monocytes (d) macrophages. (NEET 2019)
51. Which of the following is not an autoimmune disease?  
(a) Psoriasis  
(b) Rheumatoid arthritis  
(c) Alzheimer's disease  
(d) Vitiligo (NEET 2018)
52. 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?  
(a) Cell-mediated immune response  
(b) Hormonal immune response  
(c) Physiological immune response  
(d) Autoimmune response (NEET 2017)
53. MALT constitutes about \_\_\_\_\_ percent of the lymphoid tissue in human body.  
(a) 20% (b) 70% (c) 10% (d) 50% (NEET 2017)
54. Antivenom injection contains preformed antibodies while polio drops that are administered into the body contain  
(a) gamma globulin (b) attenuated pathogens  
(c) activated pathogens (d) harvested antibodies. (NEET-I 2016)
55. 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  
(a) autoimmune disease (b) active immunity  
(c) allergic response (d) graft rejection. (NEET-I 2016)
56. If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidence?  
(a) Haemocytes  
(b) Serum globulins  
(c) Fibrinogen in plasma  
(d) Serum albumins (2015, 2007)
57. Which of the following immunoglobulins does constitute the largest percentage in human milk?  
(a) IgA (b) IgG  
(c) IgD (d) IgM (2015)
58. Grafted kidney may be rejected in a patient due to  
(a) passive immune response  
(b) innate immune response  
(c) humoral immune response  
(d) cell-mediated immune response. (2015)
59. Increased asthmatic attacks in certain seasons are related to  
(a) eating fruits preserved in tin containers  
(b) inhalation of seasonal pollen  
(c) low temperature  
(d) hot and humid environment. (2007)
60. Lysozyme that is present in perspiration, saliva and tears, destroys  
(a) certain types of bacteria  
(b) all viruses  
(c) most virus-infected cells  
(d) certain fungi. (2007)
61. Antibodies in our body are complex  
(a) glycoproteins (b) lipoproteins  
(c) steroids (d) prostaglandins. (2006)
62. Damage to thymus in a child may lead to  
(a) a reduction in haemoglobin content of blood  
(b) a reduction in stem cell production  
(c) loss of antibody mediated immunity  
(d) loss of cell mediated immunity. (2005)
63. Short-lived immunity acquired from mother to fetus across placenta or through mother's milk to the infant is categorised as  
(a) active immunity  
(b) passive immunity  
(c) cellular immunity  
(d) innate non-specific immunity. (2003)
64. Interferons are synthesized in response to  
(a) mycoplasma (b) bacteria  
(c) viruses (d) fungi. (2001)
65. The antibodies are  
(a) proteins (b) carbohydrates  
(c) lipids (d) germs. (1999)
66. The term 'active immunity' means  
(a) increasing rate of heart beat  
(b) increasing quantity of blood  
(c) resistance developed after disease  
(d) resistance developed before disease. (1999)
67. If a person shows production of interferons in his body, the chances are that he has got an infection of  
(a) tetanus (b) malaria  
(c) typhoid (d) measles. (1997)



68. Antibodies are produced by  
 (a) leucocytes (b) monocytes  
 (c) lymphocytes (d) spleen. (1996)
69. The interferons are  
 (a) antigen proteins (b) antiviral proteins  
 (c) antibiotic proteins (d) all of these. (1996)
70. Which one of the following diseases is due to an allergic reaction?  
 (a) Enteric fever (b) Skin cancer  
 (c) Goitre (d) Hay fever (1995)
71. Antigens are present  
 (a) inside the cytoplasm  
 (b) on nuclear membrane  
 (c) inside the nucleus  
 (d) on cell surface. (1995)
72. A cell-coded protein that is formed in response to infection, with most animal viruses, is called  
 (a) histone (b) antibody  
 (c) interferon (d) antigen. (1994)

### 8.3 AIDS

73. Which of the following is correct regarding AIDS causative agent HIV?  
 (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. (NEET-II 2016)
74. HIV that causes AIDS, first starts destroying  
 (a) helper T-lymphocytes  
 (b) thrombocytes  
 (c) B-lymphocytes  
 (d) leucocytes. (2015 Cancelled, 2006)
75. At which stage of HIV infection does one usually show symptoms of AIDS?  
 (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 (2014)
76. Which one of the following statements is correct with respect to AIDS?  
 (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. (2010)

77. Human immuno deficiency virus (HIV) has a protein coat and a genetic material which is  
 (a) double stranded RNA  
 (b) double stranded DNA  
 (c) single stranded DNA  
 (d) single stranded RNA. (1998)

### 8.4 Cancer

78. Which of the following statements is not true for cancer cells in relation to mutations?  
 (a) Mutations inactivate the cell control.  
 (b) Mutations inhibit production of telomerase.  
 (c) Mutations in proto-oncogenes accelerate the cell cycle.  
 (d) Mutations destroy telomerase inhibitor. (NEET-I 2016)
79. Which one of the following is not a property of cancerous cells, whereas the remaining three are?  
 (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. (2012)
80. Which one of the following techniques is safest for the detection of cancers?  
 (a) Magnetic resonance imaging (MRI)  
 (b) Radiography (X-ray)  
 (c) Computed tomography (CT)  
 (d) Histopathological studies (Mains 2010)
81. Carcinoma refers to  
 (a) malignant tumours of the connective tissue  
 (b) malignant tumours of the skin or mucous membrane  
 (c) malignant tumours of the colon  
 (d) benign tumours of the connective tissue. (2003)
82. Cancerous cells can easily be destroyed by radiations due to  
 (a) rapid cell division (b) lack of nutrition  
 (c) fast mutation (d) lack of oxygen. (2002)
83. Reason of lung cancer is  
 (a) coal mining (b) calcium fluoride  
 (c) cement factory (d) bauxite mining. (2001)
84. Which of the following will be curable in next two decades?  
 (a) Tuberculosis (b) Cancer  
 (c) Poliomyelitis (d) None of these (1997)

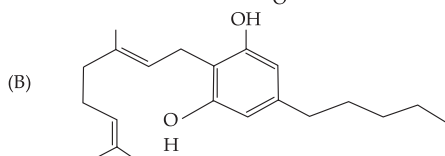
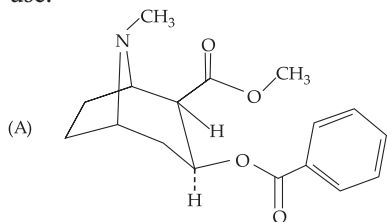
85. The blood cancer is known as  
 (a) haemolysis (b) haemophilia  
 (c) leukaemia (d) thrombosis. (1995)
86. A metastatic cancerous tumour is termed 'sarcoma' if the disorder is in  
 (a) fibroblasts (b) circulatory system  
 (c) immune system (d) epithelial cells. (1994)

### 8.5 Drugs and Alcohol Abuse

87. Drug called 'Heroin' is synthesised by  
 (a) nitration of morphine  
 (b) methylation of morphine  
 (c) acetylation of morphine  
 (d) glycosylation of morphine. (NEET 2019)
88. Which part of poppy plant is used to obtain the drug "smack"?  
 (a) Flowers (b) Latex  
 (c) Roots (d) Leaves (NEET 2018)
89. Which is the particular type of drug that is obtained from the plant whose one flowering branch is shown here?  
 (a) Hallucinogen  
 (b) Depressant  
 (c) Stimulant  
 (d) Pain killer (2014)
90. Which one of the following is a hallucinogenic drug?  
 (a) Caffeine  
 (b) Morphine  
 (c) Lysergic acid diethylamide  
 (d) Opium (Karnataka NEET 2013)



91. Cirrhosis of liver is caused by the chronic intake of  
 (a) opium (b) alcohol  
 (c) tobacco (chewing) (d) cocaine. (2012)
92. Identify the molecules (A) and (B) shown below and select the right option giving their source and use.



Molecule	Source	Use
(a) (A) Cocaine	<i>Erythroxylum coca</i>	Accelerates the transport of dopamine
(b) (B) Heroin	<i>Cannabis sativa</i>	Depressant and slows down body functions
(c) (B) Cannabinoid	<i>Atropa belladonna</i>	Produces hallucinations
(d) (A) Morphine	<i>Papaver somniferum</i>	Sedative and pain killer

(Mains 2012)

93. Select the correct statement from the ones given below.  
 (a) Barbiturates, when given to criminals, make them tell the truth.  
 (b) Morphine is often given to persons, who have undergone 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. (2010)
94. Which one of the following statements is correct?  
 (a) Benign tumours show the property of metastasis.  
 (b) Heroin accelerates body functions.  
 (c) Malignant tumours may exhibit metastasis.  
 (d) Patients who have undergone surgery are given cannabinoids to relieve pain. (2009)
95. Which one of the following is the correct statement regarding the particular psychotropic drug specified?  
 (a) Morphine leads to delusions and disturbed emotions.  
 (b) Barbiturates cause relaxation and temporary euphoria.  
 (c) Hashish causes after thought perceptions and hallucinations.  
 (d) Opium stimulates nervous system and causes hallucinations. (2008)
96. A person showing unpredictable moods, outbursts of emotion, quarrelsome behaviour and conflicts with others is suffering from  
 (a) addictive disorders  
 (b) schizophrenia  
 (c) borderline personality disorder (BPD)  
 (d) mood disorders. (2006)
97. Which one of the following depresses brain activity and produces feelings of calmness, relaxation and drowsiness?  
 (a) Morphine (b) Valium  
 (c) Amphetamines (d) Hashish (2005)
98. Which one of the following is correct match?  
 (a) Reserpine – tranquilliser  
 (b) Cocaine – opiate narcotic  
 (c) Morphine – hallucinogenic  
 (d) Bhang – analgesic (2001)

99. L.S.D. is  
 (a) hallucinogenic (b) sedative  
 (c) stimulant (d) tranquilliser. (2001)
100. Which of the following is an opiate narcotic?  
 (a) Amphetamines (b) LSD  
 (c) Barbiturates (d) Morphine (1997)
101. Nicotine acts as a stimulant, because it mimics the effect of  
 (a) testosterone (b) dopamine  
 (c) thyroxine (d) acetylcholine. (1995)
102. Opiate narcotic is  
 (a) bhang (b) charas  
 (c) heroin (d) nicotine. (1993)
103. Analgesic drugs  
 (a) form tissues (b) relieve pain  
 (c) relieve fatigue (d) cause pain. (1990)

## ANSWER KEY

1. (b) 2. (b) 3. (a) 4. (a) 5. (a) 6. (a) 7. (a) 8. (c) 9. (c) 10. (d)  
 11. (a) 12. (d) 13. (d) 14. (a) 15. (b) 16. (a) 17. (b) 18. (d) 19. (c) 20. (a)  
 21. (b) 22. (d) 23. (a) 24. (a) 25. (a) 26. (a) 27. (b) 28. (d) 29. (b) 30. (a)  
 31. (b) 32. (a) 33. (a) 34. (c) 35. (a) 36. (c) 37. (d) 38. (d) 39. (a) 40. (c)  
 41. (a) 42. (c) 43. (b) 44. (b) 45. (b) 46. (b) 47. (d) 48. (c) 49. (a) 50. (a)  
 51. (c) 52. (a) 53. (d) 54. (b) 55. (a) 56. (b) 57. (a) 58. (d) 59. (b) 60. (a)  
 61. (a) 62. (d) 63. (b) 64. (c) 65. (a) 66. (c) 67. (d) 68. (c) 69. (b) 70. (d)  
 71. (d) 72. (c) 73. (b,d) 74. (a) 75. (c) 76. (d) 77. (d) 78. (b) 79. (d) 80. (a)  
 81. (b) 82. (a) 83. (a) 84. (b) 85. (c) 86. (a) 87. (c) 88. (b) 89. (a) 90. (c)  
 91. (b) 92. (d) 93. (b) 94. (c) 95. (c) 96. (c) 97. (b) 98. (a) 99. (a) 100. (d)  
 101. (d) 102. (c) 103. (b)

## Hints &amp; Explanations

1. (b) : *Plasmodium* enters the human body as sporozoites (infectious form) through the bite of infected female *Anopheles* mosquito.

2. (b)

3. (a) : Typhoid is caused by bacteria *Salmonella typhi*, transmitted through fecal oral route. It results in high fever, abdominal pain and frequent stools and is confirmed by Widal test.

4. (a) : Elephantiasis is caused by the parasitic filarial worm, *Wuchereria bancrofti* which is transmitted from an infected person to a healthy person via the bite of mosquito (especially *Culex*). It is characterised by gross enlargement of the skin and underlying connective tissues caused by lymphatic obstruction of lymph vessels by these worms which prevent drainage of lymph from the surrounding tissues. The parts commonly affected are legs, feet, thighs but scrotum, breasts and vulva may also be involved.

5. (a) : Cholera is caused by bacterium *Vibrio cholerae*, tetanus is caused by bacterium *Clostridium tetani*, typhoid is caused by bacterium *Salmonella typhi*, small pox is caused by *Variola* virus, mumps is caused by *Paramyxovirus*, Herpes is caused by *Herpes simplex* virus and influenza is caused by *Orthomyxovirus*.

6. (a) : Babesiosis is a malaria-like parasitic disease caused by infection with *Babesia*, a parasitic protozoan. Babesiosis has been recognised as a disease of cattle and other domestic animals, until human forms of babesiosis had been discovered. *Babesia* parasites reproduce in red blood cells of mammals and cause haemolytic anaemia, quite similar to malaria. The parasite is transmitted by ticks.

7. (a)

8. (c) : *Entamoeba histolytica* is the causative organism of amoebic dysentery or amoebiasis in man. It is a microscopic endoparasite of man. It is commonly found in the upper part of the large intestine (colon) and is very often lodged in the liver, lungs, brain and testes. In its life cycle, it occurs in three distinct forms (i) trophozoite or magna form, (ii) precystic or minuta form, and (iii) cystic form. Trophozoite is the most active, motile and feeding form which is pathogenic to man. It lives in the mucosa and submucosa layers of the colon and feeds on these layers and erythrocytes.

9. (c) : Man acquires infection of *Ascaris* by directly ingesting *Ascaris* eggs, containing the infective second stage larva, with contaminated food or water. Life cycle of *Ascaris* is monogenetic. There is no vector or intermediate host.

**10. (d) :** Refer to answer 4.

**11. (a) :** *Plasmodium*, a tiny protozoan parasite causes malaria in humans, and is transmitted through the bite of infected female *Anopheles* mosquito. When female *Anopheles* sucks the blood of infected human it takes up gametocytes (sexual stages of parasite) with blood meal. The gametocytes come out of the RBCs into the lumen (cavity) of the stomach of the mosquito. In the stomach, the male gametocyte divides and forms 6 to 8 long, motile, whip-like microgametes (male gametes). The female gametocyte does not divide but undergoes a process of maturation to become the macrogamete (female gamete). A microgamete penetrates a macrogamete and fertilisation (syngamy) takes place, resulting in the formation of a zygote. The zygote elongates and becomes worm like motile organism called ookinete. Ookinete further changes into sporozoites (mature infective stage of *Plasmodium*).

**12. (d) :** Refer to answer 3.

**13. (d) :** Common cold or rhinitis is one of the most infectious diseases caused by *Rhino* viruses. It affects nose and respiratory passage but not lungs. It spreads by droplet infection or contaminated objects. Pneumonia, caused by bacteria *Streptococcus pneumoniae* and *Haemophilus influenzae* is a serious disease of lungs, in which fluid collects in the alveoli and bronchioles. The disease spreads by sputum of the patient.

**14. (a) :** Sporozoites represent the infective forms of malarial parasite. A healthy person acquires infection, when a female *Anopheles* mosquito, containing sporozoites, bites the person for sucking his blood. The mosquito punctures the host's skin by its proboscis and first introduces some saliva into the blood stream. Along with saliva, thousands of sporozoites are inoculated in the host also.

**15. (b)**

**16. (a)**

**17. (b) :** Ringworm (tinea) is a fungal infection of the skin, the scalp, or the nails. Ringworm is caused by the dermatophyte fungi-species of *Microsporum*, *Trichophyton* and *Epidermophyton* and also affects animals, a source of infection for humans. It can be spread by direct contact or *via* infected materials. The lesions of ringworm may form partial or complete rings and may cause intense itching. The disease is treated with antifungal agents taken by mouth or applied locally.

**18. (d) :** Refer to answer 3.

**19. (c) :** *Plasmodium* is a tiny protozoan which is responsible for malaria in the human. In malaria the patient experiences high fever which periodically rises and also experiences recurring chills with fever. Such symptoms are seen because when the RBCs carrying

*Plasmodium* (one of the stage in the life cycle of the parasite) ruptures it releases a toxic substance called haemozoin which is chiefly responsible for the chill and high fever recurring every three to four days.

**20. (a) :** Common cold is a viral disease. It is caused by *Rhino* viruses. It causes fever and pain all over the body and affects the nose, throat and air passages. AIDS (Acquired immuno deficiency syndrome) is a disorder of cell mediated immune system of the body. It is caused by HIV (Human Immunodeficiency Virus). HIV is a retrovirus that attacks helper T-cells.

**21. (b)**

**22. (d) :** All the options given are diseases with their associated vector which transmit the respective diseases. Leishmaniasis, also called kala azar is caused by *Leishmania donovani*. It is spread by sand fly (*Phlebotomus*) and characterised by enlarged spleen and liver with high fever.

**23. (a) :** Typhoid is caused by *Salmonella typhi*. The organisms of the disease are present in the stool. They may be present in urine. They can, therefore, be carried by water and contaminated food. Their spread through water can give rise to severe epidemics.

Polio is caused by *Enterovirus*. TB is caused by *Mycobacterium tuberculosis*. Tetanus is caused by *Clostridium tetani*.

**24. (a) :** Hepatitis B (serum hepatitis) occurs at any age and mode of transmission is through contact or blood. Infection is severe, often fatal and is accompanied by loss of appetite, nausea, whitish stool (due to lack of bile) and jaundice. 0.0002% of hepatitis B infected blood contact is enough to transmit hepatitis B.

**25. (a) :** Syphilis is caused by a spirochete (spiral bacterium) *Treponema pallidum*. AIDS is a viral disease caused by Human Immuno deficiency Virus. Gonorrhoea is a sexual disease and its causative organism is *Neisseria gonorrhoeae*. Typhoid is caused by bacillus bacteria *Salmonella typhi*.

**26. (a) :** Cholera is an acute infection of the small intestine by the bacterium *Vibrio cholerae*, which causes severe vomiting and diarrhoea (known as ricewater stools) leading to dehydration. The disease is contracted from food or drinking water contaminated by faeces from a patient. The resulting dehydration and the imbalance in the concentration of body fluids can cause death within 24 hours. Since, a large quantity of fluid and salts are rapidly lost through stools and vomit, therefore, the most important treatment is to replace the lost fluid and salts equally rapidly. Rapid replacement of fluid and electrolytes is needed by oral rehydration-therapy. The electrolytes consists of  $\text{Na}^+$  ions that prevents water loss from the body.



27. (b)                    28. (d)

29. (b) : Diphtheria is caused by *Corynebacterium diphtheriae* (bacteria) usually affecting children upto five years of age. It may start as sore throat, chills with mild fever, sometimes vomiting and headache. The most important preventive measure-against this disease is that all babies should be immunised within the first six weeks of birth using DPT vaccine.

30. (a) : Small pox is an acute highly communicable disease. It is caused by virus named *Variola* virus. Now it is eradicated from world including India. It is highly infectious disease starting with high fever, chill, backache and headache, followed by appearance of rash on the third day of illness.

31. (b) : The symptoms of red sickness are ulcerated skin, nausea and loss of hair.

32. (a) : 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 ears. It is caused by a *Paramyxovirus*, which comes out in the saliva of the infected person.

Rabies (Hydrophobia) is caused by a virus named as rabies virus. It is introduced in the body by the bite of rabid (mad) dogs usually. Fear of water is the most important characteristic symptom of this disease. Other symptoms are saliva from the mouth, severe headache, high fever, alternating periods, of excitement and depression, inability to swallow even fluids due to choked throat. The virus destroys the brain and spinal cord. Rabies is 100% fatal.

Cholera and tuberculosis are bacterial diseases caused by *Vibrio cholerae* and *Mycobacterium tuberculosis* respectively. Typhoid and tetanus are bacterial diseases caused by *Salmonella typhi* and *Clostridium tetani* respectively. AIDS is caused by HIV (human immunodeficiency virus). Syphilis is caused by spirochaete *Treponema pallidum*.

33. (a)

34. (c) : Plague is an acute epidemic disease of rats and other wild rodents caused by the bacterium *Yersinia pestis*, which is transmitted to humans by rat fleas. Headache, fever, weakness, aching limbs, and delirium develop and are followed by acute painful swellings of the lymph nodes. Bleeding under the skin, producing black patches, can lead to ulcers, which may prove fatal. Treatment with tetracycline, streptomycin and chloramphenicol is effective.

35. (a)

36. (c) : Schizont stage of *Plasmodium* occurs in human erythrocytes and liver cells. Within the human blood the sporozoites, circulates about half an hour and enters into the liver cell. The kupffer cells of the liver clear the sporozoites from the blood stream and kill many of the organisms. A fraction of sporozoites escape destruction,

however and penetrate the hepatocytes where they take up the residence. Here they multiply by schizogony.

37. (d) : *Plasmodium* is digenetic, i.e., it completes its life cycle in two hosts, asexual cycle in man and sexual cycle in *Anopheles* mosquito. The breeding places of this mosquito is ponds, marshes, swampy areas, etc. So, if all the ponds and puddles are destroyed, *Anopheles* will not be able to survive leading to destruction of its parasite, *Plasmodium*.

38. (d) : *Wuchereria bancrofti* is a parasitic filarial nematode worm spread by a mosquito vector. It is one of the three parasites that cause lymphatic filariasis. Elephantiasis can result if the infection is left untreated. Limited treatment modalities exist and no vaccines have been developed. Malaria is caused by protozoan parasites of the genus *Plasmodium*. Malaria parasites are transmitted by female *Anopheles* mosquitoes. Sleeping sickness or African trypanosomiasis is a parasitic disease in people and animals, caused by protozoa of genus *Trypanosoma* and transmitted by the tse tse fly. Kala-azar is caused by *Leishmania* (protozoan) and is transmitted by sand fly.

39. (a) : *Plasmodium* has two hosts.

(i) Female *Anopheles* mosquito : Here the sexual phase of the malarial parasite occurs and it is considered the definitive host of malarial parasite.

(ii) Human beings : Here the asexual phase of malarial parasite occurs. It is considered as the intermediate host. Options (b), (c) and (d) are the stages of the asexual phase of *Plasmodium*.

40. (c) : *Trypanosoma gambiense* is the parasitic zooflagellate which causes one of the deadliest ailments in human beings called sleeping sickness or trypanosomiasis. The disease is common in humid and subhumid zones of the African continent. The disease is transmitted by shade loving tse-tse fly (*Glossina palpalis*) which acts as the vehicle that carries the culprit protozoan parasite.

41. (a) : *Plasmodium falciparum* is the greatest killer of human beings over most parts of Africa and else where in tropics. It causes malignant (or pernicious or cerebral or tropical) tertian malaria. This malaria is most harmful. *Plasmodium vivax* causes benign tertian malaria. *Plasmodium malariae* causes quartan malaria. *Plasmodium ovale* is the rarest of the four species which infect man and it causes mild tertian malaria.

42. (c) : Laveran discovered that malaria is caused by protozoan parasite (*Plasmodium*) in 1880. He discovered *Plasmodium* and got nobel prize in 1907. Sir Ronald Ross in 1897, a doctor in Indian Army, established that malarial parasite is transmitted by the bite of a female *Anopheles* mosquito and in 1902, he got Nobel prize for this discovery.



**43. (b) :** The infective stage of *Plasmodium* is a minute organism called sporozoite. When the mosquito bites man, sporozoites present in the salivary gland of female *Anopheles* mosquito are injected into the blood of the man. These sporozoites are spindle-shaped or sickle-shaped uninucleate organisms capable of wriggling (worm-like) movements. Each sporozoite consists of elastic pellicle, cytoplasm and nucleus.

**44. (b)**

**45. (b) :** Symptoms of malaria first appear several days after the infection of the malaria parasite in man. This interval of time or the incubation period is utilized by the parasites to increase their progeny. To establish malarial symptoms, it is necessary that a large number of organisms must continue erythrocytic cycle at a time.

A healthy person acquires infection when a female *Anopheles* mosquito, containing infective stages of parasite (sporozoites) in its salivary glands, bites him for sucking his blood. Once within the human blood, the sporozoites get into liver to invade the hepatic cells. Here they multiply asexually by schizogony. Liver schizogony has two phases, pre-erythrocytic and exo-erythrocytic.

**Pre-erythrocytic phase :** After penetrating a hepatic cell each sporozoite becomes a cryptozoite. It grows for a number of days and becomes a spherical and non-pigmented schizont. It divides by schizogony (multiple fission) and forms a large number of uninucleate cells, the cryptomerozoites. During pre-erythrocytic schizogony, blood remains sterile and its inoculation does not produce infection.

**Exo-erythrocytic phase :** Cryptomerozoites enter fresh liver cells to become metacryptozoites. They undergo schizogony similar to the previous one producing enormous number of metacryptomerozoites.

Metacryptomerozoites, after escaping into blood stream, invade the erythrocytes or red blood corpuscles. This starts the erythrocytic schizogony. With erythrocytic schizogony, the symptoms of malaria starts appearing.

**46. (b)                      47. (d)**

**48. (c) :** Active immunity is slow and takes time to give its full effective response.

**49. (a) :** Transplantation of tissue/organ often fails due to non-acceptance by the patient's body therefore, tissue matching and blood group matching are essential before undertaking any graft/transplant. When the immune system recognises the protein in the transplanted tissue or organ as foreign, it initiates cellular immunity. As a result of this, there is a rejection of transplanted organs. To suppress the immune response during transplantation, histocompatibility antigen and immunosuppressants play an important role.

**50. (a) :** Colostrum (Mother's first milk) rich in immunoglobulin A(IgA) antibodies are passed to

newborn through the breast feed and provides natural passive immunity.

**51. (c) :** Autoimmune diseases are certain unrelated disorders caused by inflammation and destruction of tissues by the body's own immune response. These disorders include acquired hemolytic anaemia, pernicious anaemia, rheumatoid arthritis, myasthenia gravis, psoriasis, vitiligo, etc. Alzheimer's disease is a chronic neurodegenerative irreversible, progressive brain disorder that slowly destroys memory and thinking skills.

**52. (a) :** Refer to answer 49.

**53. (d) :** MALT are significant aggregations of lymphoid tissues which are seen in relation to the mucosa of the major tracts like respiratory, alimentary canal and urinogenital tracts. It constitutes about 50 percent of the lymphoid tissue in human body.

**54. (b) :** The Sabin vaccine or trivalent 'oral polio vaccine' consists of attenuated viral strains.

**55. (a) :** Autoimmunity is a disorder of the body's defence mechanisms in which an immune response is elicited against its own tissues, which are thereby damaged or destroyed. Autoimmunity may be caused due to genetic or environmental factors.

**56. (b) :** Serum globulins are proteins that include gamma globulins (antibodies) and a variety of enzymes and carrier/ transport proteins.

The specific profile of the globulins is determined by protein electrophoresis (SPEP), which separates the proteins according to size and charge. There are four major groups that can be identified : alpha-1 globulins, alpha-2 globulins, beta globulins and gamma globulins. Once the abnormal group has been identified, further studies can determine the specific protein excess or deficit. Since the gamma fraction usually makes up the largest portion of the globulins, therefore antibody deficiency is mainly related with the low level of serum globulins.

**57. (a) :** IgA immunoglobulins are the second most abundant class of immunoglobulins, which are mainly found in sweat, tears, saliva, mucus, colostrum and gastrointestinal secretions.

**58. (d) :** Cell-mediated immune response (CMIS) consists of T-lymphocytes. It reacts against transplants. Transplantation may result in the rejection of the transplanted organs. The immune system recognises the protein in the transplanted tissue or organ as foreign and initiates cellular immunity against it.

**59. (b) :** Increased asthmatic attacks in certain seasons are related to inhalation of seasonal pollen. Pollens are microscopic grains produced by plants in order to

reproduce. Pollen allergy is a hypersensitive reaction to pollen. Pollen induced reactions include extrinsic asthma, rhinitis and bronchitis.

**60. (a) :** Lysozyme is an antibacterial enzyme with natural antibiotic properties. Normally excreted in the tears, nasal mucus, milk, and saliva in most animals, lysozyme is part of the body's first natural defence against bacteria and viruses.

**61. (a) :** Antibodies are members of a class of proteins known as immunoglobulins. Immunoglobulins are glycoproteins in the immunoglobulin superfamily. The terms antibody and immunoglobulin are often used interchangeably. They are found in the blood and tissue fluids, as well as many secretions. In structure, they are globulins (in the  $\gamma$ -region of protein electrophoresis). They are synthesized and secreted by plasma cells that are derived from the B cells of the immune system.

**62. (d) :** The thymus is the major gland of our immune system. The thymus is responsible for many immune system functions including the production of T-lymphocytes, a type of white blood cell responsible for cell mediated immunity. Cell mediated immunity is a type of immunity in which specialized cells carry out defensive activities. They protect the body against pathogens including the protists and fungi which have entered the host's cells.

**63. (b) :** Short-lived immunity acquired from mothers to fetus across placenta or through mother's milk to the infant is categorised as passive immunity. Passive immunity, an acquired immunity, is resistance based on antibodies performed in another host. In this case, the fetus is not directly responsible for its body immunity but it becomes immunised by mother's milk across placenta.

**64. (c) :** Interferons are proteins that increase the resistance of a cell to attack by viruses by unmasking genes that synthesize antiviral proteins. In humans, three groups of interferons have been discovered:  $\alpha$ -interferons from white blood cells;  $\beta$ -interferons from connective tissue fibroblasts; and  $\gamma$ -interferons from lymphocytes.

**65. (a) :** Refer to answer 61.

**66. (c) :** Active immunity is the immune response generated in an individual due to contact with infectious pathogen or vaccination. In many cases, it is life long.

**67. (d) :** Interferons are antiviral proteins that increase the resistance of a cell to attack by viruses. As measles is a viral disease, so body produces interferons. Measles is an acute infectious eruptive viral disease of childhood, caused by an RNA containing Rubeola virus/Polynosa morbillorum. Typhoid and tetanus are bacterial diseases caused by *Salmonella typhi* and *Clostridium tetani* respectively. Malaria is a protozoan disease caused by *Plasmodium* species.

**68. (c) :** Lymphocytes secrete antibodies to destroy microbes and their toxins, reject grafts and kill tumour cells. Antibodies are proteinaceous in nature. Monocytes (type of WBC) are phagocytic in nature and engulf bacteria and cellular debris. Spleen is an organ that produces lymphocytes.

**69. (b) :** Refer to answer 64.

**70. (d) :** Hay fever is a form of allergy due to the pollen of grasses, trees, and other plants, characterized by inflammation of the membrane lining the nose and sometimes of the conjunctiva. The symptoms of sneezing, running or blocked nose and watering eyes are due to histamine released by the mast cells.

**71. (d) :** An antigen is any foreign substance like protein or polysaccharide present on the external coating of pathogen, feathers, constituent of a vegetable, fruit, meat, drug, chemical, tissue or organ transplant which induces the immune system to produce antibodies.

**72. (c)**

**73. (b, d) :** HIV is spherical virus with a diameter of about 90-120 nm. Its genome consists of a single-stranded RNA filament segmented into two identical filaments and associated with reverse transcriptase enzymes. The envelope consists of a lipid bilayer derived from host cell membrane and projecting knob like glycoprotein spikes. It contains two protein coats. HIV is a retrovirus that attacks helper T cells. Without an adequate supply of helper cells, the immune system cannot signal B cells to produce antibodies to kill infected cells, thus body becomes susceptible to infections. This immune deficiency is described by the name acquired immune deficiency syndrome or AIDS.

**74. (a) :** The AIDS retrovirus, called human immunodeficiency virus (HIV), mounts a direct attack on  $CD_4^+$  T helper cells because it recognizes the  $CD_4$  coreceptors associated with these cells.

HIV attack on  $CD_4^+$  T cells cripples the immune system in at least three ways. First, HIV-infected cells die only after releasing replicated viruses that infect other  $CD_4^+$  T cells, until the entire population of  $CD_4^+$  T cell is destroyed. Second, HIV causes infected  $CD_4^+$  T cells, to secrete a soluble suppressing factor that blocks other T cells from responding to the HIV antigen. Finally, HIV may block transcription of MHC genes, hindering the recognition and destruction of infected  $CD_4^+$  T cells, and thus protecting those cells from any remaining vestiges of the immune system. The combined effect of these responses to HIV infection is to wipe out the human immune defense.

**75. (c) :** AIDS is a disorder of cell-mediated immune system of the body. Virus responsible for AIDS is HIV



(Human Immunodeficiency virus). There is a reduction in the number of helper T-cells which stimulate antibody production by B-cells. This results in the loss of natural defence against viral infection.

**76. (d) :** AIDS (acquired immuno deficiency syndrome) a syndrome, is caused by the retrovirus HIV (human immunodeficiency virus). The virus destroys a subgroup of lymphocytes, the helper T-cells (or CD<sub>4</sub> lymphocytes), resulting in suppression of the body's immune response. HIV is transmitted in blood, semen and vaginal fluid; the major routes of infection are unprotected vaginal and anal intercourse, intravenous drug abuse, and the administration of contaminated blood and blood products. A combination of antiviral drugs can delay the development of full-blown AIDS for many years but cannot fully cure the disease.

**77. (d) :** HIV is a retrovirus, which contains single stranded RNA, surrounded by protein coat (core shell) as genetic material. It causes AIDS. HIV is different in structure from other retroviruses. It is around 120 nm in diameter (around 60 times smaller than a red blood cell) and roughly spherical.

**78. (b)**

**79. (d) :** Contact inhibition is a property of normal cells by virtue of which contact with other cells inhibits their uncontrolled growth. Cancerous cells lack this property.

**80. (a) :** Histopathological study is the invasive technique. Radiography and CT involves X-rays which are harmful.

In MRI strong magnetic fields and non-ionising radiations are used to detect any physiological changes in the concerned tissue. Hence it is safest for the detection of cancers.

**81. (b) :** Carcinoma is a cancer that arises in epithelium, the tissue that lines the skin and internal organs of the body. It may occur in any tissue containing epithelial cells. It includes cervical cancer, breast cancer, skin cancer, stomach cancer etc.

**82. (a) :** Cancerous cells are the cells that undergo rapid cell division. These cells are destroyed by X-ray radiation. During cell division, the DNA double helix opens up and undergo various other processes. Such processes are disrupted when exposed to radiation and the cancerous cells die selectively when radiated.

**83. (a) :** Lung cancer is a disease where tissue in the lung grows out of control. This may lead to metastasis, invasion of adjacent tissue and infiltration beyond the lungs. The vast majority of primary lung cancers are carcinomas of the lung, resulting from epithelial cells. One of the causes of lung cancer is exposure to coal dust. Exposure to coal dust can cause some coal mine workers

to develop pneumoconiosis, or "black lung." This occurs when inhaled coal dust becomes embedded in the lungs, causing them to harden and making breathing difficult.

**84. (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, 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.

**85. (c) :** The normal count of WBCs is 5000 to 10000 per cubic millimeter of blood. Leukaemia or blood cancer is characterized by abnormal increase of WBCs count, 20000–1000000/mm<sup>3</sup> due to their increased formation in the bone marrow. Haemolysis is breakdown of RBCs. Haemophilia is a disease in which blood clots slowly. Thrombosis is a clot formation inside the blood vessels.

**86. (a) :** Fibroblasts are the cells present in connective tissue. Sarcomas are cancers that are located in connective and muscular tissues derived from mesoderm. Thus, they include the cancers of bones, cartilages, tendons, adipose tissue, lymphoid tissue and muscles.

**87. (c) :** Heroin (smack) is chemically diacetylmorphine which is white, odourless, bitter crystalline compound. It is obtained by acetylation of morphine, extracted from latex of poppy plant.

**88. (b)**

**89. (a) :** The plant illustrated in the diagram is *Datura*. Seeds of *Datura stramonium* are misused for their hallucinogenic properties because of the presence of anticholinergic alkaloids atropine, hyoscyamine and scopolamine (= hyoscyne). However, even in slight excess, they can cause death.

**90. (c) :** LSD is a psychedelic drug since it causes optical and auditory hallucinations and induces behavioural abnormalities. Opium and morphine are opiate narcotics that suppress brain activity and relieve pain. Caffeine is a stimulant that temporarily stimulates the nervous system.

**91. (b) :** Cirrhosis is a condition in which the liver responds to injury or death of some of its cells by producing interlacing strands of fibrous tissue between which are nodules of regenerating cells. The liver becomes tawny and characteristically knobby (due to the nodules). One of the causes include alcoholism (alcoholic cirrhosis).



**92. (d) :** The given chemical structures (A) and (B) are of morphine and cannabinoid respectively. Morphine is the principal opium alkaloid. It is a strong analgesic. It also has sedative and calming effect. Morphine depresses respiratory centre, it contributes to the fall in blood pressure. Morphine is a very effective sedative and painkiller. It is very useful in patients who have undergone surgery. Natural cannabinoids are obtained from the inflorescence of hemp plant *Cannabis sativa*, family Cannabinaceae. They affect the cardiovascular system of the body.

**93. (b) :** Morphine is a potent opioid analgesic used mainly to relieve severe and persistent pain, particularly in terminally ill patients or who have undergone surgery. It also induces feelings of euphoria. It is administered by mouth, injection, or in suppositories. Common side-effects are nausea and vomiting, constipation, and drowsiness. With regular use, tolerance develops and dependence may occur.

**94. (c) :** Tumour is of two types : benign and malign. Malign or malignant tumour exhibit metastasis. It is the phenomenon in which cancer cells spread to distant sites through body fluids to develop secondary tumour.

**95. (c) :** Hashish or charas is a pure resin obtained from female flowers and leaves of selected varieties of *Cannabis sativa*. It is the most potent hemp product (cannabinoids), and is usually smoked with tobacco. Its use may lead to euphoria, hallucination, drowsiness and continuous laughing. The hallucinogens act mainly on CNS and greatly alter one's thought, feelings and perceptions.

**96. (c) :** Borderline personality disorder (BPD) is a serious mental illness characterized by pervasive instability in moods, interpersonal relationships, self-image, and behaviour. This instability often disrupts family and work life, long-term planning, and the individual's sense of self-identity. Originally thought to be at the "borderline" of psychosis, people with BPD suffer from a disorder of emotion regulation.

Schizophrenia is a group of severe mental disorders characterized by disturbances of language and communication; thought disturbances that may involve distortion of reality, misperceptions, delusions and hallucinations; mood changes and withdrawn, regressive, or bizarre behaviour, lasting longer than six months. A mood disorder is a condition where the prevailing emotional mood is distorted or inappropriate to the circumstances. Addiction is a state of dependence produced by the habitual taking of drugs, alcohol etc.

**97. (b) :** Valium is a benzodiazepine (sedative) that gives a feeling of relaxation, calmness or drowsiness in the body. Morphine is the main opium alkaloid that

depresses respiratory centre and contributes to the fall in blood pressure. Amphetamines are synthetic drugs and are stimulant in nature. Hashish is a hallucinogen.

**98. (a) :** Tranquillisers are drugs that have good effect in all types of psychosis, especially in schizophrenia. In a psychotic patient, these drugs reduce aggressiveness, thoughts and behaviour are gradually normalized and anxiety is relieved, e.g., reserpine which is an alkaloid extracted from the roots of *Rauwolfia serpentina*. Higher doses of it can cause sedation and mental depression. Cocaine is a stimulant. Morphine is an opiate narcotic. Bhang is a hallucinogenic.

**99. (a) :** Hallucinogens are drugs that change thoughts, feelings and perceptions of individuals. They cause hallucinations. LSD (Lysergic acid diethylamide) is one such hallucinogen that causes horrible dreams, chronic psychosis and severe damage to the central nervous system. Sedatives give a feeling of calmness, relaxation or drowsiness in the body. Their high doses induce sleep. Tranquillisers lower tension and anxiety without inducing sleep. Stimulants are the drugs that stimulate the nervous system, make a person more wakeful, alert and active; and cause excitement.

**100. (d) :** Opiates are derived from opium along with their synthetic relatives. Opiates have narcotic, analgesic, sedative and astringent effects. Narcotic is a drug that induces stupor and relieves pain. Morphine is the main opium alkaloid, which is a strong analgesic and also has sedative and calming effect. It depresses respiratory centre and contributes to the fall in blood pressure. It can cause release of ADH, reduction in urine output, constipation and mild hyperglycemia, etc. It causes addiction.

**101. (d) :** Nicotine is the major stimulatory component of tobacco products including cigarettes. Nicotine has a number of effects on the human body similar to acetylcholine. It stimulates passage of nerve impulses, causes muscles to relax and causes the release of adrenaline, increasing both blood pressure and heart beat rate.

**102. (c) :** The drugs derived from opium alongwith their synthetic relatives are called opioids or opiates. Opiates have narcotic, analgesic, astringent (that causes contraction of body parts), and sedative effect, i.e., heroin.

**103. (b) :** A substance that reduces pain without causing unconsciousness, either by reducing the pain threshold or by increasing pain tolerance. There are several categories of analgesic drugs, including morphine and its derivatives which produce analgesia by acting on the central nervous system; nonsteroidal anti-inflammatory drugs (e.g. aspirin); and local anaesthetics.

