

Chapter 30

Human Health and Diseases

- 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?
 - Cell-mediated immune response
 - Hormonal immune response
 - Physiological immune response
 - Autoimmune response (NEET 2017)
- MALT constitutes about _____ percent of the lymphoid tissue in human body.
 - 20%
 - 70%
 - 10%
 - 50% (NEET 2017)
- 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 is correct regarding AIDS causative agent HIV?
 - HIV is enveloped virus containing one molecule of single-stranded RNA and one molecule of reverse transcriptase.
 - HIV is enveloped virus that contains two identical molecules of single-stranded RNA and two molecules of reverse transcriptase.
 - HIV is unenveloped retrovirus.
 - HIV does not escape but attacks the acquired immune response. (NEET-II 2016)
- Antivenom injection contains preformed antibodies while polio drops that are administered into the body contain
 - gamma globulin
 - attenuated pathogens
 - activated pathogens
 - harvested antibodies. (NEET-I 2016)
- Which of the following statements is not true for cancer cells in relation to mutations?
 - Mutations inactivate the cell control.
 - Mutations inhibit production of telomerase.
 - Mutations in proto-oncogenes accelerate the cell cycle.
 - Mutations destroy telomerase inhibitor. (NEET-I 2016)
- 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
 - autoimmune disease
 - active immunity
 - allergic response
 - graft rejection. (NEET-I 2016)
- If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidence?
 - Haemocytes
 - Serum globulins
 - Fibrinogen in plasma
 - Serum albumins (2015)
- Which of the following immunoglobulins does constitute the largest percentage in human milk?
 - IgA
 - IgG
 - IgD
 - IgM (2015)
- Which of the following diseases is caused by a protozoan?
 - Babesiosis
 - Blastomycosis
 - Syphilis
 - Influenza (2015)
- Grafted kidney may be rejected in a patient due to
 - passive immune response
 - innate immune response
 - humoral immune response
 - cell-mediated immune response. (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) A-(iv), B-(iii), C-(ii), D-(i)
- (b) A-(i), B-(ii), C-(iv), D-(iii)
- (c) A-(ii), B-(i), C-(iii), D-(iv)
- (d) A-(iii), B-(ii), C-(iv), D-(i)

(2015 Cancelled)

13. The active form of *Entamoeba histolytica* feeds upon
- (a) food in intestine
 - (b) blood only
 - (c) erythrocytes, mucosa and submucosa of colon
 - (d) mucosa and submucosa of colon only.

(2015 Cancelled)

14. HIV that causes AIDS, first starts destroying
- (a) helper T-lymphocytes
 - (b) thrombocytes
 - (c) B-lymphocytes
 - (d) leucocytes.

(2015 Cancelled)

15. 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

16. 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)
17. Infection of *Ascaris* usually occurs by
- (a) Tse-tse fly
 - (b) mosquito bite
 - (c) drinking water containing eggs of *Ascaris*
 - (d) eating imperfectly cooked pork.
- (NEET 2013)
18. Which one of the following statements is correct regarding sexually transmitted diseases (STDs)?

- (a) A person may contact syphilis by sharing milk with one already suffering from the disease.
- (b) Haemophilia is one of the STDs.
- (c) Genital herpes and sickle-cell anaemia are both STDs
- (d) The chances of a 5-years boy contracting a STD are very little.

(Karnataka NEET 2013)

19. Identify the site where *Wuchereria bancrofti* is normally found in human body.

- (a) Muscles of the legs
- (b) Blood vessels of the thigh region
- (c) Skin between the fingers
- (d) Lymphatic vessels of the lower limbs

(Karnataka NEET 2013)

20. Which one of the following is a hallucinogenic drug?

- (a) Caffeine
- (b) Morphine
- (c) Lysergic acid diethylamide
- (d) Opium

(Karnataka NEET 2013)

21. Motile zygote of *Plasmodium* occurs in

- (a) gut of female *Anopheles*
- (b) salivary glands of *Anopheles*
- (c) human RBCs
- (d) human liver.

(2012)

22. Widal test is carried out to test

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

(2012)

23. Common cold differs from pneumonia in that

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

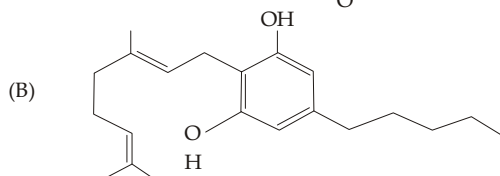
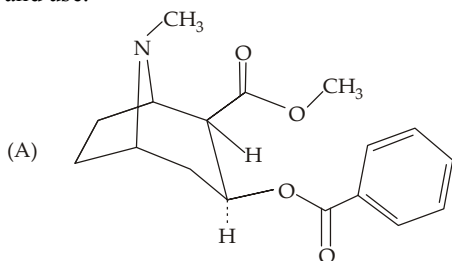
(2012)

24. 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)

25. Cirrhosis of liver is caused by the chronic intake of
 (a) opium (b) alcohol
 (c) tobacco (chewing) (d) cocaine. (2012)
26. 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)
27. 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)
28. 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 *Wuchereria bancrofti* with infected water and food
 (d) Malaria *Plasmodium vivax* bite of male *Anopheles* mosquito (Mains 2011)

29. 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)
30. Ringworm in humans is caused by
 (a) bacteria (b) fungi
 (c) nematodes (d) viruses. (2010)
31. Widal test is used for the diagnosis of
 (a) malaria (b) pneumonia
 (c) tuberculosis (d) typhoid. (2010)
32. 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)
33. Infectious proteins are present in
 (a) gemini viruses (b) prions
 (c) viroids (d) satellite viruses. (2010)
34. 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)
35. 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)

36. A person suffering from a disease caused by *Plasmodium*, experiences recurring chill and fever at the time when
- the sporozoites released from RBCs are being rapidly killed and broken down inside spleen
 - the trophozoites reach maximum growth and give out certain toxins
 - the parasite after its rapid multiplication inside RBCs ruptures them, releasing the stage to enter fresh RBCs
 - the microgametocytes and megagametocytes are being destroyed by the WBCs.
- (Mains 2010)
37. Which one of the following statements is correct?
- Benign tumours show the property of metastasis
 - Heroin accelerates body functions
 - Malignant tumours may exhibit metastasis
 - Patients who have undergone surgery are given cannabinoids to relieve pain.
- (2009)
38. Which of the following is a pair of viral diseases?
- Common cold, AIDS
 - Dysentery, common cold
 - Typhoid, tuberculosis
 - Ringworm, AIDS
- (2009)
39. 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 sterilized food and water |
| (C) Cholera | (iii) DPT Vaccine |
| (D) Syphilis | (iv) Use oral rehydration therapy |
- A – (i), B – (i), C – (iii), D – (iv)
 - A – (ii), B – (iii), C – (iv), D – (i)
 - A – (i), B – (ii), C – (iii), D – (iv)
 - A – (ii), B – (iv), C – (i), D – (iii)
- (2008)
40. Which one of the following is the correct statement regarding the particular psychotropic drug specified?
- Morphine leads to delusions and disturbed emotions.
 - Barbiturates cause relaxation and temporary euphoria.
 - Hashish causes after thought perceptions and hallucinations.
 - Opium stimulates nervous system and causes hallucinations.
- (2008)
41. Increased asthmatic attacks in certain seasons are related to
- eating fruits preserved in tin containers
 - inhalation of seasonal pollen
 - low temperature
 - hot and humid environment.
- (2007)
42. If you suspect major deficiency of antibodies in a person, to which of the following would you look for confirmatory evidence?
- Serum globulins
 - Fibrinogen in the plasma
 - Haemocytes
 - Serum albumins.
- (2007)
43. Lysozyme that is present in perspiration, saliva and tears, destroys
- certain types of bacteria
 - all viruses
 - most virus-infected cells
 - certain fungi.
- (2007)
44. The causative agent of mad-cow disease is a
- virus
 - bacterium
 - prion
 - worm.
- (2006)
45. The bacterium (*Clostridium botulinum*) that causes botulism is
- an obligate aerobe
 - a facultative anaerobe
 - an obligate anaerobe
 - a facultative aerobe.
- (2006)
46. HIV that causes AIDS, first starts destroying
- helper T-lymphocytes
 - B-lymphocytes
 - leucocytes
 - thrombocytes.
- (2006)
47. A person showing unpredictable moods, outbursts of emotion, quarrelsome behaviour and conflicts with others is suffering from
- addictive disorders
 - schizophrenia
 - borderline personality disorder (BPD)
 - mood disorders.
- (2006)
48. Antibodies in our body are complex
- glycoproteins
 - lipoproteins
 - steroids
 - prostaglandins.
- (2006)
49. Which one of the following depresses brain activity and produces feelings of calmness, relaxation and drowsiness?
- Morphine
 - Valium
 - Amphetamines
 - Hashish
- (2005)

50. 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)
51. 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 culifacies* - Leishmaniasis (2004)
52. 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)
53. Short-lived immunity acquired from mother to foetus 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)
54. Christmas disease is another name for
 (a) haemophilia B (b) hepatitis B
 (c) Down's syndrome (d) sleeping sickness. (2003)
55. 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)
56. Which one of the following is correct match?
 (a) Reserpine - tranquilliser
 (b) Cocaine - opiate narcotic
 (c) Morphine - hallucinogenic
 (d) Bhang - analgesic (2001)
57. L.S.D. is
 (a) hallucinogenic (b) sedative
 (c) stimulant (d) tranquilliser. (2001)
58. *Salmonella* is related with
 (a) typhoid (b) polio
 (c) T.B. (d) tetanus. (2001)
59. Which is the most infectious disease?
 (a) Hepatitis-B (b) AIDS
 (c) Cough and cold (d) Malaria. (2001)
60. Interferons are synthesized in response to
 (a) mycoplasma (b) bacteria
 (c) viruses (d) fungi. (2001)
61. Reason of lung cancer is
 (a) coal mining (b) calcium fluoride
 (c) cement factory (d) bauxite mining. (2001)
62. Which is showing accurate pairing?
 (a) Syphilis - *Treponema pallidum*
 (b) AIDS - *Bacillus conjugalis*
 (c) Gonorrhoea - *Leishmania donovani*
 (d) Typhoid - *Mycobacterium leprae*. (2000)
63. Which disease of man is similar with cattle's, bovine spongiform encephalopathy?
 (a) Encephalitis
 (b) Jakob-Cruetzfeldt disease
 (c) Spongiocitis of cerebrum
 (d) Spondylitis (2000)
64. Saline solution is given to patients of cholera because
 (a) Na⁺ prevents water loss from body
 (b) NaCl function as regulatory material
 (c) NaCl produces energy
 (d) NaCl is antibacterial. (2000)
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. 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)
68. Botulism caused by *Clostridium botulinum* affects the
 (a) lymph glands
 (b) central nervous system
 (c) spleen (d) intestine. (1998)
69. Typhoid fever is caused by
 (a) *Shigella* (b) *Escherichia*
 (c) *Giardia* (d) *Salmonella*. (1998)

70. Which of the following is an opiate narcotic?
 (a) Amphetamines (b) LSD
 (c) Barbiturates (d) Morphine (1997)
71. Which of the following will be curable in next two decades?
 (a) Tuberculosis (b) Cancer
 (c) Poliomyelitis (d) None of these (1997)
72. Diphtheria is caused by
 (a) nematodes (b) bacteria
 (c) virus (d) none of these. (1997)
73. Which of the following diseases is now considered completely eradicated from India?
 (a) Small pox (b) Poliomyelitis
 (c) Plague (d) Kala-azar (1997)
74. 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)
75. 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)
76. Which of the following pair of diseases is caused by virus?
 (a) Rabies, mumps
 (b) Cholera, tuberculosis
 (c) Typhoid, tetanus
 (d) AIDS, syphilis (1996)
77. Antibodies are produced by
 (a) leucocytes (b) monocytes
 (c) lymphocytes (d) spleen. (1996)
78. The interferons are
 (a) antigen proteins
 (b) antiviral proteins
 (c) antibiotic proteins
 (d) all of these. (1996)
79. Which of the following is the false statement about antibiotics?
 (a) Some persons have allergy from antibiotics.
 (b) Antibiotics are capable of curing any disease.
 (c) This term was given by Waksman in 1942.
 (d) Antibiotics is produced by micro-organisms. (1996)
80. Nicotine acts as a stimulant, because it mimics the effect of
 (a) testosterone (b) dopamine
 (c) thyroxine (d) acetylcholine. (1995)
81. The blood cancer is known as
 (a) haemolysis (b) haemophilia
 (c) leukaemia (d) thrombosis. (1995)
82. 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)
83. Which one of the following diseases is due to an allergic reaction?
 (a) Enteric fever (b) Skin cancer
 (c) Goitre (d) Hay fever (1995)
84. Which of the following causes plague?
 (a) *Trichinella spiralis*
 (b) *Salmonella typhimuium*
 (c) *Yersinia pestis*
 (d) *Leishmania donovani* (1995)
85. Antigens are present
 (a) inside the cytoplasm
 (b) on nuclear membrane
 (c) inside the nucleus
 (d) on cell surface. (1995)
86. 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)
87. 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)
88. A metastatic cancerous tumour is termed 'sarcoma' if the disorder is in
 (a) fibroblasts (b) circulatory system
 (c) immune system (d) epithelial cells. (1994)

89. The main reason why antibodies could not solve all the problems of bacteria mediated disease is
 (a) decreased efficiency of the immune system
 (b) insensitivity of the individual following prolonged exposure to antibiotics
 (c) development of mutant strains resistant to antibodies
 (d) inactivation of antibiotics by bacterial enzymes.
 (1994)
90. Opiate narcotic is
 (a) bhang (b) charas
 (c) heroin (d) nicotine.
 (1993)
91. 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)
92. Analgesic drugs
 (a) form tissues (b) relieve pain
 (c) relieve fatigue (d) cause pain.
 (1990)
93. Which one engulfs pathogens rapidly?
 (a) Acidophils (b) Monocytes
 (c) Basophils (d) Neutrophils
 (1989)

Answer Key

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

EXPLANATIONS

1. (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.

2. (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.

3. (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*.

4. (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.

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

6. (b)

7. (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.

8. (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.

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

10. (a) : Babesiosis is a malaria-like parasitic disease caused by infection with *Babesia*, a parasitic protozoan. Babesiosis has long 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.

11. (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.

12. (a) :

13. (c) : *Entamoeba histolytica* (Gr., *entos* : within + *amoeba* : change + *histos* : tissue + *lysis* : dissolve) 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 mucous and submucous layers of the colon and feeds on these layers and erythrocytes.

14. (a) : The AIDS retrovirus, called human immunodeficiency virus (HIV), mounts a direct attack on CD4⁺ T helper cells because it recognizes the CD4 coreceptors associated with these cells.

HIV's attack on CD4⁺ T cells cripples the immune system in at least three ways. First, HIV-infected cells die only after releasing replicated viruses that infect other CD4⁺ T cells, until the entire population of CD4⁺ T cell is destroyed. Second, HIV causes infected CD4⁺ 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 CD4⁺ 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.

15. (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.

16. (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.

17. (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.

18. (d) : Syphilis is caused by bacterium *Treponema pallidum*. It is a sexually transmitted disease (STD) which is transferred through sexual intercourse with infected person. Haemophilia is a X-linked genetic disorder of blood. It is not transmitted via any sexual practice. Genital herpes is an STD while sickle-cell anaemia is an autosomal hereditary disorder.

The chances of a 5 year boy contracting an STD are very little since he is unlikely to have sex at this age.

19. (d) : *Wuchereria bancrofti* is a dreaded human parasite. It is a digenetic parasite completing its life cycle in two hosts, the final host is man harbouring the adult worm.

The disease passes through four stages in human beings:

In the first stage, the patient has increased eosinophils, enlarged lymph nodes. Second or carrier stage is symptomless. Third stage is characterised by filarial fever, inflammation of lymph nodes (lymphadenitis) and lymph vessels (lymphangiectasis) and reversible lymphoedema (excess fluid in tissues due to

obstruction of lymph vessels) in various body parts. The fourth or final stage is manifested by lymphoedema accompanied by thickening of subcutaneous tissues and skin so that there is permanent swelling mostly of feet, legs, thighs, scrotal sacs, breast etc. It is called elephantiasis.

20. (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.

21. (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 fertilization (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*).

22. (d) : Widal test (developed by G.F.I Widal) is an agglutination test for the presence of antibodies against the *Salmonella* organism that cause typhoid fever. It is used to diagnose the presence of the disease in a patient.

23. (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.

24. (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.

25. (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 knobbly (due to the nodules). One of the causes include alcoholism (alcoholic cirrhosis).

26. (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.

27. (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.

28. (b)

29. (a) : Common cold is caused by some 100 types of *Rhino* viruses. It is one of the most common infectious disease in human. Antibiotics are substances that destroy or inhibit the growth of microorganisms, particularly disease-producing bacteria and fungi. Antibiotics are obtained from microorganisms (especially moulds) or synthesized. Many antibiotics interfere with the pathogen protein synthesis. Some (e.g. Penicillin) prevent cross-linking of the glycan chains of peptidoglycan molecules in bacterial cell walls. Since the viruses do not possess cell wall and their own protein synthesising apparatus, they are not attacked by antibiotics.

30. (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.

31. (d) : Refer to answer 22.

32. (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 CD4 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.

33. (b) : Prions are named by Stanley Prusiner (got Nobel Prize in 1997). Prions are infectious agents which are made of proteins only (without nucleic acid). Prions are the causal agents of scrapie disease of sheep.

34. (b) : Morphine is an 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.

35. (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 safe for detection of cancers.

36. (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.

37. (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.

38. (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.

39. (b)

40. (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.

41. (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.

42. (a) : Serum globulin are globulins occurring in blood serum and containing most of the antibodies of the blood. Serum globulin electrophoresis is a laboratory test that examines specific proteins in the blood called globulins. Globulins are roughly divided into alpha, beta, and gamma globulins. These can be separated and quantitated in the laboratory by electrophoresis and densitometry.

43. (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. Lysozyme is an enzyme that degrade the polysaccharide protective coating on the surface of many bacteria and viruses (glycoprotein covering) to allow other enzymes and antibodies to find their appropriate attachment sight. Most of the bacteria affected by lysozyme are not pathogenic. Lysozyme serves as a non-specific innate opsonin by binding to the bacterial surface, reducing the negative charge and facilitating phagocytosis of the bacterium before opsonins from the acquired immune system arrive at the scene. In other words, lysozyme makes it easier for phagocytic white blood cells to engulf bacteria.

44. (c) : Mad cow disease is the common term for Bovine spongiform encephalopathy (BSE), a progressive neurological disorder of cattle. It is caused by prions. Symptoms include an excitable or nervous temperament to external stimuli such as touch to the skin. A prion (short for proteinaceous infectious particle) is a unique type of infectious agent, as it is made only of protein. Prions are abnormally-structured forms of a host protein, which are able to convert normal molecules of the protein into the abnormal structure.

45. (c) : *Clostridium* is a genus of gram-positive bacteria. They are obligate anaerobes capable of producing endospores. Individual cells are rod-shaped.

Foodborne disease caused by *C. botulinum* is referred to as botulism (a muscle-paralyzing disease). It is caused by the ingestion of a neurotoxin (botulin) produced by the microorganism in the food. Botulin blocks nerve function leading to respiratory and musculoskeletal paralysis. Symptoms of botulism include weakness, fatigue and dizziness, followed by blurred vision and progressive difficulty in speaking and swallowing. Weakening of the respiratory muscles is also observed and death may occur due to respiratory failure.

46. (a) : Refer to answer 32.

47. (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.

48. (a) : Antibody 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 γ -region of protein electrophoresis). They are synthesized and secreted by plasma cells that are derived from the B cells of the immune system.

49. (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.

50. (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. T-cells and B-cells are the type of lymphocytes that develop from bone marrow cells. Those lymphocytes that migrate to the thymus and differentiate are called T-cells and those cells that continue to be in the bone marrow for differentiation are known as B-cells. T-cells are responsible for cell mediated immunity, however, B-cells produce antibodies and take part in antibody mediated immunity.

51. (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.

Sleeping sickness is caused by a protozoan *Trypanosoma gambiense*. Filariasis is caused by worm *Wuchereria bancrofti*. Dengue fever is caused by arbo virus.

52. (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.

53. (b) : Short-lived immunity acquired from mothers to foetus 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 foetus is not directly responsible for its body immunity but it becomes immunised by mother's milk across placenta.

54. (a) : Haemophilia B, a type of haemophilia is also known as christmas disease. It is due to deficiency of a blood coagulation factor, the christmas factor (factor IX). Christmas was the person (20th century) in whom the factor was first identified. Haemophilia B is a defect of the blood which prevents its clotting.

55. (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.

56. (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.

57. (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.

58. (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*.

59. (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.

60. (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: α -interferons from white blood cells; β -interferons from connective tissue fibroblasts; and γ -interferons from lymphocytes.

61. (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.

62. (a) : Syphilis is caused by a spirochete (spiral bacterium) *Treponema pallidum*. The symptoms of syphilis occur in three stages. The first stage usually consists of a painless lesion called a chancre at the organism's site of entry. The second stage begins as the organism enters the blood. Symptoms such as fever, a flu like illness, a skin rash, hair loss, and swollen joints may come and go over a period of several years. In the third stage permanent brain damage, heart disease, and blindness often occurs.

AIDS is a viral disease caused by Human Immuno deficiency virus. Gonorrhoea is a sexual disease and its causative organism is *Neisseria gonorrhoea*. Typhoid is caused by bacillus bacteria *Salmonella typhi*.

63. (b) : The common term for bovine spongiform encephalopathy is mad cow disease, which is a progressive neurological disorder of cattle. In humans it is called Creutzfeldt-Jakob disease, after the two doctors who first described the symptoms of the disease. It is caused by prions (proteinaceous infectious particles). It is characterized by rapidly progressive dementia associated with myoclonic jerks. The brains of affected individuals show a characteristic cystic degenerations.

64. (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 Na^+ ions that prevents water loss from the body.

65. (a) : Refer to answer 48.

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) : 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.

68. (b) : Refer to answer 45.

69. (d) : Refer to answer 58.

70. (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 hyperglycaemia etc. It causes addiction.

Barbiturates are substituted derivatives of barbituric acid. They reduce anxiety and induce sleep. Amphetamines are synthetic drugs which are strong stimulants. LSD (Lysergic acid diethylamide) is the most powerful hallucinogens that causes severe damage to central nervous system.

71. (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. TB is curable by taking anti-tubercular drugs and polio may be on the verge of eradication if the pulse polio programme succeeds.

72. (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. Throat and/or tonsils show a grey membrane which may spread down and cause hoarseness and difficulty in breathing. Nose may be affected giving rise to a

blood-tinged nasal discharge from one nostril. If the disease is not treated early and properly the toxin produced by the bacteria affects the heart and the nervous system, and proves fatal. The germs are present in the discharges from the nose and throat of patients and also of healthy people who act as the "carriers". The patients and the carriers spread the disease through acts like kissing, talking, coughing and sneezing. Incubation period is of 2 - 5 days. The patient should be kept in a well-ventilated room if there is no isolation hospital in the town. 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.

73. (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. The rash appears first on the face, then on the rest of the body. The rash starts as small reddish spots which change into papules. These in turn change into small vesicles containing clear fluid. Vesicles change into pustules. Finally, a scab is formed and it falls off by the third week. These scabs leave deep pits or scars known as pock marks. The virus is present in the oral and nasal discharges of the patients and is ejected during the acts of coughing, sneezing, etc., and infects the healthy people.

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

75. (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.

76. (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*.

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

78. (b) : Refer to answer 60.

79. (b) : Antibiotics are not capable of curing any disease. Antibiotics are those substances that destroy or inhibit the growth of micro-organisms, particularly disease producing bacteria and fungi. The term antibiotic was introduced by Waksman in 1942. Antibiotics are obtained from micro-organisms (especially moulds) or synthesized. Common antibiotics include penicillins, streptomycin and tetracyclines. They are used to treat various infections but tend to weaken the body's natural defence mechanisms and can cause allergies. Overuse of antibiotic can lead to the development of resistant strains of micro-organism.

80. (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.

81. (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, 20000–100000/mm³ 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.

82. (a) : Syphilis is caused by a spirochete (spiral bacterium) *Treponema pallidum*.

Sleeping sickness is a disease of tropical Africa caused by the presence in the blood of the parasitic protozoan, *Trypanosoma gambiense*. Plague is an epidemic disease of rats which is transmitted to humans by rat fleas. Dengue is a disease transmitted to humans by mosquito, *Aedes aegypti*.

83. (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.

84. (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.

Trichinosis is caused by *Trichinella spiralis* which lives as an endoparasite in human intestine. *Salmonella typhimurium* causes enteric fevers. *Leishmania donovani* causes kala-azar.

85. (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.

86. (c) : Refer to answer 60.

87. (a) : Syphilis is caused by a spirochete (spiral bacterium) *Treponema pallidum*. Gonorrhoea is caused by *Neisseria gonorrhoea*. Urethritis is inflammation of urethra.

88. (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.

89. (c) : Bacteria develop mutant strains that become resistant to antibodies, so these antibodies become incapable of removing bacteria mediated diseases.

90. (c) : The drugs derived from opium along with their synthetic relatives are called opioids or opiates. Opiates have narcotic, analgesic, astringent (that causes contraction of body parts), and sedative effect.

91. (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 tsetse fly. Kala-azar is caused by *Leishmania* (protozoan) and is transmitted by sand fly.

92. (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.

93. (d) : Neutrophils, are the most abundant type of white blood cells and form an integral part of the immune system. These phagocytes are normally found in the blood stream. However, during the acute phase of inflammation, particularly as a result of bacterial infection, neutrophils leave the vasculature and migrate toward the site of inflammation in a process called chemotaxis. They are the predominant cells in pus, accounting for its whitish/yellowish appearance. Neutrophils react within an hour of tissue injury and are the hallmark of acute inflammation. Monocytes are also phagocytes but take 7-8 hours to reach at the site of injury. Acidophils and basophils are not phagocytic in nature.

