

## UNIT – VIII : BIOLOGY AND HUMAN WELFARE

### Term-II

# HUMAN HEALTH AND DISEASES

## Syllabus

- Pathogens; parasites causing human diseases (malaria, dengue, chikungunya, filariasis, ascariasis, typhoid, pneumonia, common cold, amoebiasis, ringworm) and their control; Basic concepts of immunology – vaccines; cancer, HIV and AIDS; Adolescence, drug and alcohol abuse.



## STAND ALONE MCQs

(1 Mark each)

Q. 1. The term 'Health' is defined in many ways. The most accurate definition of the health would be

- (A) health is the state of body and mind in a balanced condition.
- (B) health is the reflection of a smiling face.
- (C) health is a state of complete physical, mental, and social well-being.
- (D) health is the symbol of economic prosperity. ☐

Ans. Option (C) is correct.

**Explanation :** Health may be defined as a person's mental and physical condition. It is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. When people are healthy, they are more efficient in their work. It also increases longevity of people and reduces infant and maternal mortality.

Q. 2. The organisms which cause diseases in plants and animals are called

- (A) pathogens. (B) vectors.
- (C) insects. (D) worms. ☐

Ans. Option (A) is correct.

**Explanation :** Pathogens are diseases causing microorganisms. It may be bacteria, virus,

fungi, etc. Pathogen disrupt the normal physiology of a multicellular animal or plant. Vector is an organism that spreads a disease or parasite from one animal to another.

Q. 3. When an apparently healthy person is diagnosed as unhealthy by a psychiatrist, the reason could be that

- (A) the patient was not efficient at his work.
- (B) the patient was not economically prosperous.
- (C) the patient shows behavioural and social maladjustment.
- (D) he does not take interest in sports. ☐

Ans. Option (C) is correct.

**Explanation :** Health is a state of complete physical, mental, and social well-being. So, when an apparently healthy person is diagnosed as unhealthy by a psychiatrist the reason could be that the patient shows behavioural and social maladjustment due to mental discomfort. If patient is not efficient at his/her work and do not show interest in routine, social, and sports activities it means that he is physically not well and need treatment by a psychiatrist.

Q. 4. Diseases are broadly grouped into infectious and non-infectious diseases. In the list given below, identify the infectious diseases. (i) Cancer (ii) Influenza (iii) Allergy (iv) Small pox

- (A) (i) and (ii)                      (B) (ii) and (iii)  
(C) (iii) and (iv)                    (D) (ii) and (iv)                    **U**

**Ans. Option (D) is correct.**

**Explanation :** In the given list, influenza (ii) and small pox (iv) are infectious diseases. Infectious diseases can be spread from one person to another, through contact with body fluids, by aerosols (through coughing and sneezing), or via a vector. Whereas cancer and allergy are non-communicable diseases and cannot spread from infected persons to healthy person.

**Q. 5.** The chemical test that is used for diagnosis of typhoid is

- (A) ELISA-Test                      (B) ESR-Test  
(C) PCR-Test                      (D) Widal-Test                    **R**

**Ans. Option (D) is correct.**

**Explanation :** Widal test is used to help make a presumptive diagnosis of enteric fever, also known as typhoid fever. Typhoid is caused by *Salmonella typhi*. It is spread through food, milk, and water contaminated with intestinal discharges either directly or through flies and personal hygiene. Enzyme-linked immunosorbent assay (ELISA) is used in immunology to detect the presence of an antibody or an antigen in a sample. Erythrocyte sedimentation rate test (ESR) is used to detect inflammation that may be caused by infection and some autoimmune diseases. Polymerase chain reaction (PCR) test is used in molecular biology. It is used to make numerous copies of a specific segment of DNA quickly and accurately.

**Q. 6.** One of the following is not the causal organism for ringworm.

- (A) Microsporum                    (B) Trichophyton  
(C) Epidermophyton                (D) Macrosporum                   **U**

**Ans. Option (D) is correct.**

**Explanation :** Ringworm infections are caused by fungi belonging to the genera Microsporum, Trichophyton, and Epidermophyton. Macrosporum is an ecto-mycorrhizal zoosporic fungus causing diseases of economically important vascular plants.

**Q. 7.** Which type of immune response is responsible for the rejection of tissues/organs in the patient's body post transplantation ?

- (A) auto-immune response  
(B) humoral immune response  
(C) physiological immune response  
(D) cell-mediated immune response                    **R**

**Ans. Option (D) is correct.**

**Explanation :** The body is able to differentiate self and non-self and the cell-mediated immune response is responsible for the graft rejection.

**Q. 8.** Which of the following toxic substance is responsible for the malarial fever.

- (A) Haemocyanin                    (B) Haemozoin  
(C) Haemoglobin                    (D) Haemoriden                    **R**

**Ans. Option (B) is correct.**

**Explanation :** The rupture of RBCs is associated with release of a toxic substance, haemozoin, which is responsible for the chill and high fever recurring every three to four days.

**Q. 9.** Non-specific host defence that exists prior to the exposure of an antigen is called :

- (A) acquired immunity            (B) passive immunity  
(C) innate immunity                (D) active immunity               **R**

**Ans. Option (C) is correct.**

**Explanation :** Innate immunity is non-specific type of defence, that is present at the time on birth.

**Q.10.** A person with sickle cell anaemia is

- (A) more prone to malaria.  
(B) more prone to typhoid.  
(C) less prone to malaria.  
(D) less prone to typhoid.                    **R**

**Ans. Option (C) is correct.**

**Explanation :** A person with sickle cell anaemia is less prone to malaria because in sickle cell anaemia red blood cells become abnormally shaped, if they inherit two faulty copies of the gene for the oxygen-carrying protein haemoglobin. The faulty gene persists because even carrying one copy of it confers some resistance to malaria. Therefore, people with normal haemoglobin A are susceptible to death from malaria but people with sickle cell trait who have one gene for haemoglobin A and other for haemoglobin S have a greater chance of surviving malaria and do not suffer adverse consequences from the haemoglobin S gene.

**Q. 11.** Opium is obtained from:

- (A) *Papaver somniferum*  
(B) *Cannabis sativa*  
(C) *Erythroxylum coca*  
(D) *Datura metel*                    **R**

**Ans. Option (A) is correct.**

**Explanation :** Opium, narcotic drug that is obtained from the unripe seedpods of the opium poppy (*Papaver somniferum*).

Q. 12. Synthetic drugs structurally related to adrenaline are

- (A) hallucinogens                      (B) Analgesics  
(C) Amphetamines                      (D) Barbiturates                      R

Ans. Option (C) is correct.

**Explanation :** Amphetamines (stimulants) mimic the effect of the naturally produced hormone adrenaline.

Q. 13. 'Smack' is a drug obtained from the

- (A) latex of *Papaver somniferum*.  
(B) leaves of *Cannabis sativa*.  
(C) flowers of *Datura*.  
(D) fruits of *Erythroxyl coca*.                      R

Ans. Option (A) is correct.

**Explanation :** Heroin, commonly called smack, is chemically diacetyl morphine. It is a white, odourless, bitter, crystalline compound which is obtained by acetylation of morphine, extracted from the latex of poppy plant (*Papaver somniferum*). Leaves of *Cannabis sativa* (commonly called bhang) produces cannabinoids. Datura flower produces tropane alkaloids (mainly scopolamines, hyoscyamine and atropine). Atropine reduce salivation and bronchial secretions before surgery. It is also used to dilate the pupil before eye exams and to relieve pain which is caused by swelling and inflammation in the eye. Cocaine is extracted from the dried leaves and young twigs of *Erythroxyl coca*.

Q. 14. Tobacco consumption is known to stimulate secretion of adrenaline and nor-adrenaline. The component causing this could be

- (A) nicotine                                      (B) tannic acid  
(C) curamin                                      (D) catechin                                      R

Ans. Option (A) is correct.

**Explanation :** Nicotine is highly addictive and harmful for human health. *Nicotiana tabacum*, the type of nicotine is found in tobacco plants. Nicotine present in tobacco stimulates adrenal gland to release adrenaline and noradrenaline hormone which in turn increases the blood pressure and heart rate.

Q. 15. The chronic intake of ..... causes Cirrhosis of liver.

- (A) opium                                      (B) alcohol  
(C) cocaine                                      (D) tobacco

Ans. Option (B) is correct.

**Explanation :** Cirrhosis, which is a deadly liver disease caused due to excessive consumption of alcohol which damages the liver in such a way that is generally irreversible.

Q. 16. Which one is correctly matched ...

- (A) Cocaine – Opiate narcotic  
(B) Bhang – Analgesic  
(C) Reserpine – Tranquilizer  
(D) Morphine – Hallucinogen

Ans. Option (C) is correct.

**Explanation :** Cocaine is a natural stimulant. It stimulates nervous system and delays fatigue. Bhang is a hallucinogen Morphine is a natural opiate derived from opium. Reserpine is a tranquiliser. It has sleep inducing properties.

Q. 17. Which compound is formed by acetylation of morphine ?

- (A) Heroin                                      (B) Cocaine  
(C) Tobacco                                      (D) Marijuana

Ans. Option (A) is correct.

**Explanation:** Heroin is synthesised by acetylation of the two hydroxyl groups of morphine with acetyl chloride, hence its other names, diacetylmorphine or diamorphine.

Q. 18. Marijuana is extracted from

- (A) dried leaves and flowers of hemp plant  
(B) ergot fungus  
(C) roots of hemp plant  
(D) cocoa plant.

Ans. Option (A) is correct.

**Explanation :** Marijuana is extracted from leaves and flowers of *Cannabis sativa*.

Q. 19. \_\_\_\_\_ is a CNS stimulant as it interferes with the transport of the neuro-transmitter, dopamine.

- (A) Valium                                      (B) Barbiturate  
(C) Cocaine                                      (D) Opium

Ans. Option (C) is correct.

**Explanation :** Cocaine attaches to the dopamine transporter and blocks the normal recycling process, resulting in a buildup of dopamine in the synapse, which contributes to the pleasurable effects of cocaine.

Q. 20. Which drug is used as medicine to help patients cope with depression and insomnia ?

- (A) Morphine                                      (B) Amphetamines  
(C) Codeine                                      (D) LSD

Ans. Option (B) is correct.

**Explanation :** Amphetamines stimulates the nervous system, increases alertness and produces excitement.



## ASSERTION AND REASON BASED MCQs (1 Mark each)

**Directions :** In the following questions a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

- (A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (C) Assertion (A) is true but reason (R) is false.
- (D) Assertion (A) is false but reason (R) is true.

**AI Q. 1. Assertion (A) :** Acquired immunity is pathogen specific.

**Reason (R) :** It is not present since birth.

**Ans. Option (A) is correct.**

**Explanation :** Acquired immunity is learned, it is not present at birth.

**Q. 2. Assertion (A) :** Sharing of injection needles between two individuals is not recommended.

**Reason (R) :** This transmits STDs like AIDS and Hepatitis from the diseased person to the healthy person.

**Ans. Option (A) is correct.**

**Explanation :** Sharing of injection needles is not recommended so as to avoid the transmission of STDs like AIDS and Hepatitis from the diseased person to the health person.

**Q. 3. Assertion (A) :** Pathogens are disease causing organisms.

**Reason (R) :** *Salmonella typhi* is a pathogenic virus causing tuberculosis.

**Ans. Option (C) is correct.**

**Explanation :** *Salmonella typhi* is a pathogenic bacterium that causes typhoid fever in human beings.

**Q. 4. Assertion(A) :** The colostrum provides passive immunity to the newborn baby.

**Reason(R) :** In this, the readymade antibodies are directly given to protect the body.

**Ans. Option (A) is correct.**

**Explanation :** Colostrum (Mother's first milk) contains good amount of antibodies like IgA, which provide passive immunity to the new born and protects it from various infections.

**Q. 5. Assertion (A):** Bone marrow and thymus are primary lymphoid organs.

**Reason(R):** It is the organs, to which matured lymphocytes migrate, interact with antigens and then proliferate to become effector cells.

**Ans. Option (C) is correct..**

**Explanation :** Bone marrow and thymus are primary lymphoid organs as here immature lymphocytes differentiate into antigen-sensitive lymphocytes.

**AI Q. 6. Assertion (A) :** Opioids, also called opiates used to treat pain.

**Reason (R) :** Opioids are the drugs which bind to specific opioid receptors present in our central nervous system.

**Ans. Option (A) is correct..**

**Explanation :** When opioids bind to specific receptors present in our CNS, they block the pain messages sent from the body through the spinal cord to the brain.

**AI Q. 7. Assertion (A) :** Heroin, the smack is chemically diacetylmorphine.

**Reason (R) :** Heroin is obtained by acetylation of morphine.

**Ans. Option (A) is correct.**

**Explanation :** Reason is the correct explanation of assertion. Heroin is obtained by acetylation of morphine, which is extracted from the latex of the poppy plant.

**Q. 8. Assertion (A) :** Cocaine are drug of abuse.

**Reason (R) :** Cocaine interferes in the working of central nervous system.

**Ans. Option (C) is correct.**

**Explanation :** Cocaine interferes with the transport of the neurotransmitter dopamine, which acts as chemical messenger in our body.

**Q. 9. Assertion (A) :** Smoking increases the carbon monoxide (CO) content in the blood which has greater affinity to haemoglobin than oxygen.

**Reason (R) :** CO forms a stable bond with haemoglobin and does not allow binding of oxygen. It reduces concentration of haem bound oxygen and causes oxygen deficiency in the body.

**Ans. Option (C) is correct..**

**Explanation :** Smoking increases the carbon monoxide (CO) content in the blood which has greater affinity to haemoglobin than oxygen. CO forms a stable bond with haemoglobin and does not allow binding of oxygen. It reduces concentration of haem bound oxygen and causes oxygen deficiency in the body. Smok

ing also damages alveolar walls, which reduces respiratory surface (emphysema).

**Q. 10. Assertion (A) :** Ganja is obtained from *Cannabis sativa* / hemp plant.

**Reason (R) :** It is hallucinogenic, alters perception, causes illusion and damages cardiovascular system.

**Ans. Option (C) is correct..**

**Explanation :** Ganja is obtained from *Cannabis sativa* / hemp plant. It is hallucinogenic, alters perception, causes illusion and damages cardiovascular system.



## CASE-BASED MCQs

**Attempt any four sub-parts from each question.**

**Each sub-part carries 1 mark.**

**I. Read the following text and answer the following questions on the basis of the same :**

Shivani studies in class I. Her parents come from a backward family and are unaware of immunization programme. So, she did not get vaccinated properly. Once playing with her friends in the park, she fell down due to weakness and later complained of high fever, head ache and stiffness in her neck.

**Q. 1.** The microbe responsible for Shivani's illness may be:

- (A) *Vibrio cholerae*                      (B) *Enterovirus*
- (C) *Plasmodium*                        (D) *Mycobacterium*

**Ans. Option (A) is correct.**

**Explanation :** The symptoms shown by Shivani suspects of having polio which is caused by a species of enterovirus.

**Q. 2.** Which vaccine if administered earlier, would have saved Shivani from the illness she contracted unfortunately?

- (A) MMR Vaccine                      (B) Varicella Vaccine
- (C) BCG Vaccine                        (D) Salk Vaccine

**Ans. Option (D) is correct.**

**Explanation :** Salk Vaccine or inactivated polio virus vaccine if administered earlier would have saved Shivani from contracting the disease.

**Q. 3.** The disease that Shivani has contracted spreads through:

- (A) Mosquito bite
- (B) Bite of infected dog

(C) Fecal oral route

(D) Direct contact of an infected person

**Ans. Option (C) is correct.**

**Explanation :** Polio virus is contagious it spreads through – stool of an infected person, droplets from sneeze, cough of infected person.

**Q. 4.** This type of infection produces inflammation in:

- (A) Bones                                      (B) Liver
- (C) Nervous System                        (D) Heart

**Ans. Option (C) is correct.**

**Explanation :** Polio produces inflammation in nervous system.

**Q. 5.** A step that can help to eradicate the disease Shivani has contracted is:

- (A) Live polio Vaccine
- (B) Killed polio Vaccine
- (C) Combination of live and killed vaccines
- (D) None of the above

**Ans. Option (C) is correct.**

**Explanation :** Combination of live and killed polio vaccine can help in eradication of polio a disease Shivani has contracted.

**II. Read the following text and answer the following questions on the basis of the same:**

Health is defined as a state of complete physical, mental and social well being. Balanced diet, personal hygiene and regular exercise are very important to maintain good health. Any disturbance of structure or function of the body may be regarded as disease. Diseases can broadly be categorized into infectious (communicable) and non-infectious (non-communicable). A wide range of organisms belonging to bacteria, viruses, fungi, protozoans etc. could cause diseases in man.

Q. 1. Which of the following diseases are communicable ?

- (A) Infectious diseases
- (B) Deficiency diseases
- (C) Allergies
- (D) Degenerative diseases.

Ans. Option (A) is correct.

**Explanation:** Communicable, or infectious diseases, are caused by microorganisms such as bacteria, viruses, parasites and fungi that can be spread, directly or indirectly, from one person to another.

Q. 2. Which among the following is a set of bacterial diseases ?

- (A) Cholera, typhoid and mumps
- (B) Malaria, mumps and poliomyelitis
- (C) Diphtheria, leprosy and plague
- (d) Tetanus, Tuberculosis and measles.

Ans. Option (C) is correct.

**Explanation :** Diphtheria is a serious bacterial infection that affects the mucous membranes of the throat and nose. Although it spreads easily from one person to another, diphtheria can be prevented through the use of vaccines.

Leprosy is a chronic, progressive bacterial infection caused by the bacterium *Mycobacterium leprae*. It primarily affects the nerves of the extremities, the skin, the lining of the nose, and the upper respiratory tract.

The plague is a serious bacterial infection that can be deadly. Sometimes referred to as the "black plague," the disease is caused by a bacterial strain called *Yersinia pestis*. This bacterium is found in animals throughout the world and is usually transmitted to humans through fleas.

Q. 3. The nature of the spread of communicable diseases is known as \_\_\_\_\_.

- (A) Parasitology      (B) Immunology
- (C) Epidemiology      (D) None of these.

Ans. Option (C) is correct.

**Explanation :** Epidemiology deals with the occurrence, distribution and causes of diseases in mankind.

Q. 4. DPT vaccine is used for the immunization of :

- (A) Cholera      (B) Bubonic plague
- (C) Typhoid fever      (D) Whooping cough.

Ans. Option (D) is correct.

**Explanation :** DTP vaccine can prevent diphtheria, tetanus, and pertussis. Diphtheria and pertussis spread from person to person. Tetanus enters the body through cuts or wounds. Diphtheria can lead to difficulty breathing, heart failure, paralysis, or death.

**Directions :** In the following questions a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as :

- (A) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
- (B) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
- (C) Assertion (A) is true but reason (R) is false.
- (D) Assertion (A) is false but reason (R) is true.

Q. 5. Assertion (A) : Diphtheria is caused by *Corynebacterium diphtheriae*.

Reason (R) : *Corynebacterium diphtheriae* produce a potent exotoxin that inhibits protein synthesis in epithelial cells.

Ans. Option (A) is correct.

III. Read the passage and answer any four questions.

A group of youth were having a 'rave party' in an isolated area and was raided by police. Packets of 'smack' and syringes with needles were found littered around.

Q. 1. Why is taking 'smack' considered an abuse ?

- (A) because it causes drug dependence
- (B) because it affects nervous system
- (C) because it impairs one's psychological functions
- (D) all of these

Ans. Option (D) is correct.

**Explanation :** An addictive substance causes drug dependence and affects nervous system. When used in more amounts or frequencies it impairs ones physical and psychological functions.

Q. 2. Which of the following drug is commonly known as Smack?

- (A) Heroin      (B) Morphine
- (C) Codeine      (D) Pethidine

Ans. Option (A) is correct.

**Explanation :** Heroin is commonly known as smack or brown sugar. It is a semisynthetic white crystalline powdery substance, which is chemically diacetylmorphine and is obtained by the acetylation of morphine.

Q. 3. 'Smack' is a drug obtained from the

- (A) Latex of *Papaver somniferum*

- (B) Leaves of *Cannabis sativa*
- (C) Flowers of *Datura*
- (D) Fruits of *Erythroxylum coca*

**Ans. Option (A) is correct.**

**Explanation :** Latex of *Papaver somniferum*.

**Q. 4.** Syringes and needles used by the youth for taking the drug could prove to be very fatal as:

- (A) They can acquire serious infections.
- (B) They can lead to malnutrition.
- (C) They can cause transmission of parasitic disease.
- (D) They can lead to cardiac arrest.

**Ans. Option (A) is correct.**

**Explanation :** They can acquire serious infections / transmission of HIV infections / AIDS / Hepatitis.

**Q. 5.** When an healthy person is diagnosed as unhealthy by a psychiatrist , the reason could be that

- (A) The patient was not efficient at his work.
- (B) The patient was not economically prosperous.
- (C) The patient shows behavioural and social maladjustment.
- (D) The does not take interest in sports.

**Ans. Option (C) is correct.**

**Explanation :** Health can be defined as a state of complete physical, mental and social well-being. So, when an apparently healthy person is diagnosed as unhealthy by a psychiatrist, the reason could be that the patient shows behavioral and social maladjustment. Due to mental discomfort.