

X Std Biology Chapter 2 – IMMUNE SYSTEM

(1 MARK -1Q) (2 MARKS – 1Q) (5 MARKS -1 Q) Total marks - 8

PART – A

CHOOSE THE CORRECT ANSWER

1. Pick out a case of healthy state of an individual.

- i) Mr. X is recovering from an infectious disease.
- ii) Mr. Y takes insulin injection every day.
- iii) Mrs. Z is very depressed.
- iv) Mr. K does his duty and spends time joyfully.

Ans : iv) Mr. K does his duty and spends time joyfully.

2. Which one of the following is not socially balanced ?

- i) He enjoys a birthday party. ii) He behaves rudely over trivial matters.
- iii) He adjusts well to the surrounding situation. iv) He attends to his ailing mother at the hospital.

Ans : ii) He behaves rudely over trivial matters.

3. _____ is a bacterial disease.

- i) Meningitis ii) Rabies iii) Tetanus iv) Small pox

Ans : iii) Tetanus

4. One of the following is transmitted through air. Find it out.

- i) Tuberculosis ii) Meningitis iii) Typhoid iv) Cholera

Ans : i) Tuberculosis

5. The most serious form of malaria is caused by Plasmodium _____.

- i) ovale ii) malariae iii) falciparum iv) vivax

Ans : iii) falciparum

6. An example of protozoan infecting our intestine is _____

- i) Plasmodium vivax ii) Entamoeba histolytica iii) Trypanosoma gambiense iv) Taenia solium

Ans : ii) Entamoeba histolytica

7. One of the means of indirect transmission of a disease is _____.

- i) sneezing ii) coughing iii) through placenta iv) using utensils of patients

Ans : iv) using utensils of patients

8. When antibodies, extracted from other animals are injected into your body, what kind of immunity do you gain?

- i) Artificially active acquired immunity ii) Artificially passive acquired immunity
- iii) Naturally active acquired immunity iv) Naturally passive acquired immunity

Ans : ii) Artificially passive acquired immunity

9. The first vaccine injected into a just born baby is _____.

- i) Oral polio ii) DPT iii) DPT and Oral polio iv) BCG

Ans : iv) BCG

10. In order to lead a healthy life, a person should enjoy physical, mental and social well-being. If a person lacks any one of them, then that person is suffering from _____.

Ans : Disease

11. A child eats food rich in carbohydrates and avoids protein in its diet. Which type of nutritional deficiency will affect that child?

- i) Kwashiorkar ii) Nyctalopia iii) Diabetes iv) Down syndrome

Ans : i) Kwashiorkar

12. Assertion (A) Expulsion of excess unused glucose in the blood through urine is observed in a diabetic mellitus person.

Reason (R) : insulin is not produced in sufficient quantity by pancreas.

- i) Both 'A' and 'R' are true and 'R' explains 'A'. ii) Both 'A' and 'R' are true but 'R' doesn't explain 'A'.
- iii) Only 'A' is true but 'R' is false. iv) A is false but 'R' is true.

Ans : i) Both 'A' and 'R' are true and 'R' explains 'A'.

PART - B

13. Marasmus and Kwashiorkar are both protein deficiency defects. Marasmus differs from Kwashiorkar in enlarged belly and swelling in the face. Are these symptoms for the above diseases correct? If not, correct it.

Ans : No, the symptoms for the above diseases are not correct.

In **Marasmus**, the child loses weight and suffers severe diarrhea and it will appear as though bones are covered by skin.

In **Kwashiorkar**, the child develops an enlarged belly and swelling in the face.

14. A list of disorders is given below. Pick out the odd one out and give reasons.

(Thalassaemia, haemophilia, night blindness, albinism, sickle cell anaemia)

Ans : **Night blindness** is a vitamin deficiency disease.

Thalassaemia, Haemophilia, albinism and sickle cell anaemia are hereditary diseases.

15. What are the symptoms of common cold?

i) _____ ii) _____

Ans : 1. Inflammation of upper respiratory passage – nasal epithelium.

2. Flow of mucous.

16. Differentiate between the diseases-night blindness and colour blindness.

Ans :

| No. | Night blindness | Colour blindness |
|-----|--|--|
| 1. | It is a vitamin deficiency disease . | It is a hereditary or Genetic disorder . |
| 2. | It is caused due to the deficiency of Vitamin A | It is caused due to defective or mutated gene . |

17. After observing dark patches with itching sensation on the skin of a student in a school hostel, the warden advises his roommates not to share towels, clothes and combs among themselves. Name the disease the student is suffering from and name the causative organisms.

Ans : The name of the disease is **Ringworm**. The causative organisms are

1. Epidermophyton,

2. Microsporum and

3. Trichophyton

18. Name the vector host of the malarial parasite. Mention the species of malarial parasite which causes malignant and fatal malaria.

Ans : The vector host of the malarial parasite is the female *Anopheles* mosquito.

Plasmodium falciparum causes malignant and fatal malaria.

19. Name the tests done for the diagnosis and confirmation of AIDS.

Ans : **Test for HIV Virus:**

i. Enzyme Linked Immuno Sorbent Assay (ELISA)

ii. Western Blot – a confirmatory test.

20. What is triple antigen? Name the three diseases which, can be prevented by using it.

Ans : **DPT** is known as **Triple Antigen**.

The three diseases which, can be prevented by using triple antigen are

1. Diphtheria,

2. Pertussis and

3. Tetanus

21. Mention the type of immunity acquired by a baby through breast-feeding.

Ans : The type of immunity acquired by a baby through breast-feeding is **Naturally Passive Acquired Immunity**.

22. Study the following statements and state whether they are true or false.

i) Colour blindness is a genetic disorder, whereas night blindness is a nutritional disorder.

ii) Pernicious anaemia is a nutritional deficiency disease, whereas sickle cell anaemia is a genetic disease / disorder.

iii) Administering TT injection to an injured child is related to passive artificial immunity, whereas giving BCG vaccine is active artificial immunity.

iv) Malaria is a bacterial disease, whereas ring worm is a viral disease.

Ans : i) Colour blindness is a genetic disorder, whereas night blindness is a nutritional disorder. - **TRUE**

ii) Pernicious anaemia is a nutritional deficiency disease, whereas sickle cell anaemia is a genetic disease / disorder. - **TRUE**

iii) Administering TT injection to an injured child is related to passive artificial immunity, whereas giving BCG vaccine is active artificial immunity. – **FALSE**

Corrected Statement : Administering TT injection to an injured child and giving BCG vaccine are **Artificially Active Acquired Immunity**

iv) Malaria is a bacterial disease, whereas ring worm is a viral disease. - **FALSE**

Corrected Statement : Malaria is a **protozoan** disease, whereas ring worm is a **fungus** disease.

23. Ramya is suffering from bleeding gums and loosening teeth. On diagnosis, it was found to have been caused by vitamin deficiency. Tell Ramya the vitamin that is lacking in her food and the name of deficiency disease she is suffering from.

(A) Vitamins (B) Deficiency diseases (C) Symptoms are given. Match B and C with A:

| A | B | C |
|------------------------|---------------------|----------------------------------|
| Vitamins | Deficiency diseases | Symptoms |
| Vitamin A | Nyctalopia | Night Blindness |
| Vitamin B ₁ | Scurvy | Nervous disorder |
| Vitamin C | Rickets | Bleeding gums |
| Vitamin D | Haemorrhage | Defective calcification of bones |
| Vitamin K | Beri-beri | Profuse loss of blood |

Ans : Ramya is suffering from the disease “**Scurvy**”
It is caused due to deficiency of **Vitamin C**

| A | B | C |
|------------------------|---------------------|----------------------------------|
| Vitamins | Deficiency diseases | Symptoms |
| Vitamin A | Nyctalopia | Night Blindness |
| Vitamin B ₁ | Beri-beri | Nervous disorder |
| Vitamin C | Scurvy | Bleeding Gum |
| Vitamin D | Rickets | Defective calcification of bones |
| Vitamin K | Haemorrhage | Profuse loss of blood |

24. A health worker advises the people in a locality not to have tattooing done using common needles and to insist the barber to change the shaving razors/ blades in the salon. Name the dreadful disease, the spreading of which, can be prevented by following these measures. Also mention other preventive measures that can be taken with regard to this disease.

Ans : The dreadful disease is **AIDS**.

Other preventive measures are

- Protected sexual behaviour.
- Safe sex practices and
- Screening of blood for HIV before blood transfusion.
- Usage of disposable syringes in the hospitals.

25. Match the following:

| List I (Disease) | List II (Symptoms) |
|------------------|--|
| A. Amoebiasis | I) Chills and high fever recurring for 3 to 4 days |
| B. Tuberculosis | II) Patches on skin and nails with itching sensation |
| C. Ringworm | III) Abdominal pain with blood and mucus in stools |
| D. Malaria | IV) Persistent cough and loss of body weight |

Ans :

| | List I(Diseases) | List II (Symptoms) |
|---|--------------------|---|
| A | Amoebiasis | Abdominal pain with blood and mucus in stools. |
| B | Tuberculosis | Persistent cough and loss of body weight |
| C | Ringworm | Patches on skin and nails with itching sensation. |
| D | Malaria | Chill and high fever for 3 to 4 days. |

26. A student had an attack of measles and recovered from the infection. His science teacher said that he will not get that disease again in his life time. Is it true? Why?

Ans : Yes, it is true. Because natural immunity against measles which is acquired through disease will give life long immunity.

27. List out the diseases based on their mode of transmission (water borne, air borne, sexual contact)

- cholera
- typhoid
- tuberculosis
- leprosy
- syphilis
- gonorrhoea
- pneumonia
- common cold
- amoebic dysentery
- AIDS

Ans :

| Mode of transmission | Disease |
|----------------------|---|
| Water borne | 1.Cholera 2.Typhoid and 3.Amoebic dysentery |
| Air borne | 1.Tuberculosis 2.Leprosy 3.Pneumonia and 4.Common cold |
| Sexual contact | 1.Syphilis 2.Gonorrhoea and 3.AIDS |

28.i) Give any three examples for the most infectious diseases in man and their causative agents.

ii) To discover medicine for viral infected diseases like AIDS is more difficult than other diseases. Is the statement true or false? Discuss.

Ans : i. The most infectious diseases in man and their causative agents are

| | Diseases | Causative agent |
|----|--------------|---|
| 1. | Influenza | A (H ₁ N ₁) VIRUS |
| 2. | Tuberculosis | Mycobacterium tuberculosis |
| 3. | Typhoid | Salmonella typhi |

ii. The statement is **true**. Because HIV causes profound immuno suppression in humans. It is due to the depletion of one type of WBC, which, is involved in the formation of antibodies called CD4 plus T-helper cells (lymphocytes).

As the HIV attacks T₄ cells, our body cannot synthesize immunity against AIDS. Hence it is difficult to discover medicine for AIDS.

29. Name the causative organisms responsible for ring worm in humans? Mention the symptoms of the infection.

Ans : Ring worm is caused by **three** different **genera** of fungi namely,

1. **Epidermophyton,**
2. **Microsporum and**
3. **Trichophyton**

Symptoms of Ringworm

Fungi can live on the dead cells of epidermis. They can cause superficial infections in skin, hair, nail, etc. form patches and cause itching.

30. Pick out the odd ones:

- i) AIDS : Retro virus, lymphocytes, BCG, ELISA
- ii) Bacterial disease : Rabies, cholera, common cold, influenza
- iii) DPT vaccine : Diphtheria, tuberculosis, pertusis, tetanus
- iv) Infective stage of Plasmodium in humans : Sporozoites, merozoites, trophozoites, gametocytes.
- v) Mental dimension : brightness of skin, normal metabolism, no black rings around eyes, knows his capacity.

Ans : i) AIDS : Retro virus, lymphocytes, BCG, ELISA

Odd one : BCG

ii) Bacterial disease : Rabies, cholera, common cold, influenza

Odd one :

iii) DPT vaccine : Diphtheria, tuberculosis, pertusis, tetanus

Odd one : cholera

iv) Infective stage of Plasmodium in humans : Sporozoites, merozoites, trophozoites, gametocytes.

Odd one : Sporozoites

v) Mental dimension : brightness of skin, normal metabolism, no black rings around eyes, knows his capacity.

Odd one : Knows his capacity.

31. In the manufacturing of anti-venom injection against snake bite, antibodies produced in the horse are being used. Mention the type of immunity involved.

Ans : **Artificial Passive Acquired Immunity**

32. Say whether each of the following diseases is a metabolic disorder, a genetic disorder or a nutritional deficiency disease.

- i) thalassemia ii) beriberi iii) diabetes mellitus iv) bubble boy syndrome v) scurvy vi) marasmus vii) obesity viii) Alzheimer’s disease ix) nyctalopia x) haemophilia

Ans :

| | |
|--------------------------------|---|
| Metabolic Disorder | 1.Diabetes mellitus 2.Obesity 3.Alzheimer’s disease |
| Genetic disorder | 1.Thalassemia 2.Bubble boy syndrome 3.Haemophilia |
| Nutritional deficiency disease | 1.Beriberi 2.Scurvy 3.Marasmus 4.Nyctalopia |

33. Find the correct statement (True / False) :

- i) Tuberculosis is caused by Mycobacterium tuberculosis bacteria.
ii) Typhoid is caused by Trichophyton fungi.
iii) Malaria is caused by Plasmodium vivax.
iv) Influenza is caused by Entamoeba histolytica protozoan.

Ans : i) Tuberculosis is caused by Mycobacterium tuberculosis bacteria. - **TRUE**

ii) Typhoid is caused by Trichophyton fungi. – **FALSE**

Corrected statement : Typhoid is caused by **Salmonella typhi**

iii) Malaria is caused by Plasmodium vivax. - **TRUE**

iv) Influenza is caused by Entamoeba histolytica protozoan. – **FALSE**

Corrected statement : Influenza is caused by **A(H1N1) Virus**

34. Malarial fever is not caused in a person immediately after introducing the sporozoites by an infected anopheles mosquito. Why?

Ans : When the mosquitoes bite a healthy person, the sporozoites (the infectious stage) are introduced into his body. They multiply within the liver cells first and enter the Red Blood Cells(RBC) of man, resulting in the rupture of RBC. This results in the release of toxic substance called haemozoin which is responsible for the chill and high fever , recurring every three to four days. Hence malarial fever is not caused in a person immediately after introducing the sporozoites by an infected anopheles mosquito

35. Name the stages of Plasmodium.

- i) Introduced by an infected Anopheles mosquito.
ii) Picked up by Anopheles mosquito from an infected human being.

Ans : i) Introduced by an infected Anopheles mosquito – **Sporozoites (Asexual Stage)**

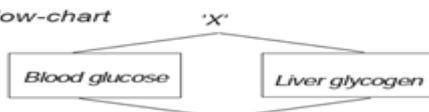
ii) Picked up by Anopheles mosquito from an infected human being - **Gametocytes (Sexual Stage)**

36. Name two diseases that are transmitted by houseflies. Mention their causative pathogens.

Ans :

| Diseases that are transmitted by houseflies | Causative pathogens |
|---|--|
| 1.Amoebic dysentery (Amoebiasis) | Entamoeba histolytica – a protozoan parasite |
| 2.Typhoid | Salmonella typhi – Bacteria |

37. Observe the following flow-chart



Mention the metabolic disorder 'X' and the causative factor from the options given below:

| Disorder | Factors |
|---------------------------|---|
| a) Diabetes insipidus | Deficiency of ADH hormone |
| b) Diabetes mellitus | Deficiency of insulin hormone |
| c) Coronary heart disease | Blockage of arteries supplying blood to heart muscles |
| d) Renal failure | Failure of nephrons to filter the blood |

Ans : The metabolic disorder “X” is **Diabetes mellitus**.

The causative factor is ‘ **Deficiency of Insulin Hormone**’

PART - C

38. Kala has delivered a baby,

i) Suggest the immunization schedule for the baby, in the first six months.

ii) What are the diseases that can be cured as per the schedule?

Ans : i..The immunization schedule for the baby, in the first six months .

| S.No. | Age | Vaccine | Dosage |
|-------|-----------------------|-------------|----------------------|
| 1. | New born | BCG | 1 st dose |
| 2. | 15 days | Oral polio | 1 st dose |
| 3. | 6 th week | DPT & Polio | 1 st dose |
| 4. | 10 th week | DPT & Polio | 2 nd dose |
| 5. | 14 th week | DPT & Polio | 3 rd dose |

ii.The diseases that can be cured as per the schedule.

BCG –Tuberculosis

Oral polio - Polio

DPT - Diptheria, Pertusis & Tetanus (Triple Antigen)

39. There is a widespread outbreak of malaria in your area.

i) Suggest some controlling measures to the local authorities concerned.

ii) Pick out the right symptom for malaria. (chills, shivering and a rise in temperature / diarrhoea)

Ans : i. **Controlling measures of Malaria.**

1.Sanitary measures include ground fogging with disinfectants.

2.Closure of stagnant pools of water and covering ditches is suggested.

3.Using mosquito nets and repellants also, will grossly lower the chance for infection.

ii. The right symptom for malaria is **chills, shivering and a rise in temperature**

40. 15th October is observed as 'Handwashing Day' i) Tell your friend the effects of hand washing.

ii) How frequently do you wash your hands everyday and when?

Ans : i. **The effects of hand washing.**

1.It minimizes the growth of harmful bacteria and virus.

2.It limits the spread of infectious microbes.

3.It prevents the entry of disease causing germs into the body.

ii. **The occasions in which we wash our hands.**

1.Before and after the food.

2.After using the toilet.

3.If we touch fomites of diseased person.

4.After playing

5.After disposing sanitary products and garbage.

41. What is immunity? Write a note on the various types of immunity.

Ans : **Immunity:** Immunity is the body's defence against or the specific resistance exhibited towards infectious organisms.

Types of Immunity

I.Natural or Innate Immunity: The **natural or innate immunity** enables an individual to develop resistance to the disease, to which, the particular species is immune.

e.g. Plant diseases do not affect animals.

II.Acquired or Specific Immunity: The resistance against some infectious diseases developed by an individual during lifetime, on exposure to the infections is called **acquired or specific** immunity.

A. Active acquired immunity: This kind of immunity is developed by our body, during the first infection of any pathogen. The antibodies produced in the blood remain for a long period and kill the similar pathogens, whenever they enter the body.

1. Naturally Active Acquired Immunity: If the antibody production is stimulated naturally after recovery from a disease, it is called Naturally Active Acquired Immunity.

2.Artificially Active Acquired Immunity: If the antibody synthesis is stimulated by administration of vaccines or any other man-made methods, the immunity thus gained is called Artificially Active Acquired Immunity. For example the polio drops and the triple antigen injection given to the child in the immunization programme.

B. Passive Acquired Immunity: In this type of immunity, a ready-made antibody is introduced from outside, instead of stimulating the body to produce antibody with antigenic stimulus.

1. Naturally Passive Acquired Immunity : If the readymade antibody is taken from the mother's blood into the foetus, it is called Naturally Passive Acquired Immunity.

2. Artificial Passive Acquired Immunity: If the readymade antibody is given to an individual artificially, (produced in some other animal and extracted) it is called Artificial Passive Acquired Immunity. This immunity is not permanent.

42. Describe the life-cycle of plasmodium in man.

Ans : Life cycle of malarial parasite – Plasmodium:

1. The sexual stage of Plasmodium takes place in female Anopheles mosquito whereas the asexual stage occurs in man.

2. When a female Anopheles mosquito bites an infected person, these parasites enter the mosquito and undergo further development in the body of the mosquito.

3. The parasites multiply within the body of the mosquito to form sporozoites that are stored in the salivary glands of the mosquito.

4. When these mosquitoes bite a healthy person, the sporozoites (the infectious stage) are introduced into his body.

5. They multiply within the liver cells first and enter the Red Blood Cells (RBC) of man, resulting in the rupture of RBC.

6. This results in the release of toxic substance called haemozoin which is responsible for the chill and high fever, recurring every three to four days.

43. List out the various diseases caused due to nutritional deficiency. Add a note on their symptoms.

Ans : 1. Protein Deficiency diseases

| Disease | Symptoms |
|----------------|---|
| 1. Marasmus | The child loses weight and suffers severe diarrhoea and it will appear as though bones are covered by skin. |
| 2. Kwashiorkor | The child develops an enlarged belly with face and feet swelling. |

2. Vitamin Deficiency Disease

| Vitamin | Deficiency disease | Symptoms |
|-------------|--------------------|--------------------------------------|
| Vitamin A | Nyctalopia | Night blindness |
| Vitamin D | Rickets | Defective calcification of bones |
| Vitamin E | Sterility | Inability to reproduce |
| Vitamin K | Haemorrhage | Profuse loss of blood |
| Vitamin B1 | Beri-Beri | Nervous disorder |
| Vitamin B5 | Pellagra | Dementia, dermatitis, diarrhoea |
| Vitamin B12 | Pernicious anaemia | Destruction of RBC |
| Vitamin C | Scurvy | Bleeding gums and loosening of teeth |

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