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Human Health and Disease — CBSE Class 12 Biology Chapter Test

FREE CHAPTER TEST · CLASS XII · BIOLOGY (044) · PATTERN OF THE CBSE SAMPLE QUESTION PAPER 2026-27

TIME ALLOWED	MAXIMUM MARKS	QUESTIONS	NAME / ROLL NO.
1½ hours	37	17 (A 8 · B 3 · C 3 · D 1 · E 2)	

GENERAL INSTRUCTIONS

Read the following instructions very carefully and strictly follow them:

1. This question paper contains 17 questions. All questions are compulsory.
2. This question paper is divided into five sections: A, B, C, D and E.
3. Section A (Q1–8) contains 6 multiple choice questions and 2 assertion-reason based questions of 1 mark each.
4. Section B (Q9–11) contains short answer questions of 2 marks each.
5. Section C (Q12–14) contains short answer questions of 3 marks each.
6. Section D (Q15) contains case-based questions of 4 marks each, with sub-parts of 1, 2 and 1 marks.
7. Section E (Q16–17) contains long answer questions of 5 marks each.
8. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 1 question in Section D, 2 questions in Section E. Attempt only one of the alternatives in such questions.
9. Draw neat, labelled diagrams wherever necessary.
10. This chapter test follows the section structure, question types and marks per question of the CBSE Class XII Biology (044) Sample Question Paper 2026-27, at about half the length of the 70-mark board paper: 37 marks in 1½ hours.
11. The answer key and the marking scheme are at the end of this booklet. Attempt the paper in 1½ hours before you look at them.

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Chapter: Human Health and Disease · **Topics:** Common diseases in humans · Innate and acquired immunity · Vaccination, allergy and autoimmunity · Immune system · AIDS · Cancer, drugs and alcohol abuse

SECTION A

This section comprises 8 questions of 1 mark each: 6 multiple choice questions (MCQs) and 2 assertion-reason based questions.

1. Typhoid fever can be confirmed by the 1

(A) ELISA test (B) Mantoux test

(C) PCR test (D) Widal test

2. The most serious (malignant) malaria is caused by 1

(A) Plasmodium falciparum (B) Plasmodium vivax

(C) Plasmodium malariae (D) Entamoeba histolytica

3. Elephantiasis (filariasis) is caused by 1

(A) Trypanosoma (B) Leishmania

(C) Wuchereria (D) Taenia

4. The drug obtained from the coca plant, Erythroxylum coca, is 1

(A) morphine (B) cocaine

(C) heroin (D) marijuana

5. Genes in normal cells that can cause cancer when they are activated under certain conditions are called 1

(A) proto-oncogenes (B) operator genes

(C) regulator genes (D) structural genes

6. Heroin (smack) is chemically 1

(A) benzoylmethylecgonine (B) a cannabinoid

(C) diacetylmorphine (D) lysergic acid diethylamide

7. **Assertion (A):** Antibiotics are effective in treating the common cold. 1
Reason (R): The common cold is caused by rhinoviruses.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

8. **Assertion (A):** Morphine is a very effective sedative and painkiller. 1
Reason (R): Cannabinoids interact with cannabinoid receptors present mainly in the brain.

(A) Both A and R are true and R is the correct explanation of A.

(B) Both A and R are true but R is not the correct explanation of A.

(C) A is true but R is false.

(D) A is false but R is true.

SECTION B

This section comprises 3 short answer questions of 2 marks each.

9. (a) Distinguish between active and passive immunity, with one example of each. 2

OR

(b) Distinguish between the primary and the secondary immune responses.

10. (a) What is an allergy? Which antibodies and chemicals are involved? 2

OR

(b) What is autoimmunity? Give one example of an autoimmune disease.

11. What is a vaccine? How does vaccination protect a person from a disease? 2

SECTION C

This section comprises 3 short answer questions of 3 marks each.

12. Describe the four types of barriers of innate immunity, with one example of each. 3

13. Describe how HIV multiplies in the human body and leads to AIDS. 3

14. Distinguish between benign and malignant tumours. What is metastasis? Give two methods of detecting cancer. 3

SECTION D

This section comprises 1 case-based question of 4 marks, with sub-parts of 1, 2 and 1 marks.

15. A school counsellor notices that a Class 11 student, who used to be a good student, has started missing classes, his marks have fallen, he has lost interest in hobbies and has become withdrawn and aggressive. His friends say that he has started taking alcohol and drugs with some older boys.

(I) Give two warning signs of drug or alcohol abuse seen in this student. [1]

(II) State two harmful effects of the chronic use of alcohol and drugs on the body. [2]

(III) Give one measure that can help prevent drug and alcohol abuse among adolescents. [1]

OR

(III) What is meant by the withdrawal syndrome? [1]

SECTION E

This section comprises 2 long answer questions of 5 marks each.

16. (a) Name the causative organism, mode of transmission and one symptom of each of the following diseases: (i) typhoid, (ii) pneumonia, (iii) amoebiasis, (iv) ascariasis, (v) ringworm. 5

OR

(b) Describe the life cycle of Plasmodium, from its entry into the human body to its return to the human through a mosquito. What causes the chills and high fever of malaria?

17. (a) Describe the structure of an antibody molecule, and name four types of antibodies. Distinguish between the humoral and the cell-mediated immune responses, and explain why organ transplants are sometimes rejected. 5

OR

(b) Describe the primary and secondary lymphoid organs of the human body and their functions. What is MALT?

END OF THE QUESTION PAPER

ANSWER KEY — SECTION A

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8
(D)	(A)	(C)	(B)	(A)	(C)	(D)	(B)

MARKING SCHEME AND WORKED SOLUTIONS

Marks for each step are shown in brackets, as in the CBSE marking scheme. Any correct alternative method earns full marks.

Q1. Answer (D). The Widal test detects antibodies against Salmonella typhi.

Q2. Answer (A). P. falciparum causes malignant malaria, which can be fatal.

Q3. Answer (C). The filarial worms Wuchereria bancrofti and W. malayi, transmitted by the bite of the female mosquito, cause chronic inflammation of the organs in which they live.

Q4. Answer (B). Cocaine (coke, crack) is a stimulant that interferes with the transport of the neurotransmitter dopamine.

Q5. Answer (A). Proto-oncogenes (cellular oncogenes) can lead to the oncogenic transformation of cells when activated.

Q6. Answer (C). Heroin is diacetylmorphine, obtained by acetylation of morphine from the latex of the poppy plant Papaver somniferum.

Q7. Answer (D). The common cold is a viral infection; antibiotics act against bacteria, not viruses. A is false, R is true. Answer D.

Q8. Answer (B). Both are true, but the cannabinoids have nothing to do with the action of morphine, an opioid that binds opioid receptors. Answer B.

Q9. (2 marks) Answer: (a) own antibodies vs ready-made antibodies; (b) low intensity vs intense (memory).
(a) Active immunity: the body produces its own antibodies when exposed to antigens (live or dead microbes or other proteins), e.g. after an infection or vaccination; it is slow but long-lasting. [1] Passive immunity: ready-made antibodies are given directly, e.g. antibodies from the mother through the placenta or in colostrum, or anti-tetanus serum; it is quick but short-lived. [1]
OR (b) The primary response, on the first encounter with a pathogen, is of low intensity. [1] The secondary (anamnestic) response, on a later encounter with the same pathogen, is much more intense, because the body has memory of the first encounter. [1]

Q10. (2 marks) Answer: (a) exaggerated response; IgE, histamine, serotonin; (b) attack on self cells; rheumatoid arthritis.
(a) The exaggerated response of the immune system to certain antigens in the environment (allergens, e.g. mites in dust, pollen, animal dander). [1] The antibodies produced are of the IgE type; mast cells release chemicals such as histamine and serotonin, which cause the symptoms; antihistamines, adrenalin and steroids reduce them. [1]
OR (b) Autoimmunity: the immune system, due to genetic or unknown reasons, attacks the body's own cells (fails to tell self from non-self). [1] Example: rheumatoid arthritis. [1]

Q11. (2 marks) Answer: antigen or weakened pathogen; memory cells.
A preparation of antigenic proteins of a pathogen, or of inactivated or weakened pathogens. [1] Introduced into the body, it makes the body produce antibodies against it and generates memory B- and T-cells; when the person is later exposed to the real pathogen, these recognise it quickly and overwhelm it with a massive production of antibodies. [1]

Q12. (3 marks) Answer: physical, physiological, cellular, cytokine.
Physical barriers: the skin, and the mucus coating of the respiratory, gastrointestinal and urogenital tracts, which traps microbes. [1]
Physiological barriers: acid in the stomach, saliva in the mouth, tears from the eyes. Cellular barriers: leukocytes such as polymorpho-nuclear leukocytes (PMNL-neutrophils), monocytes, natural killer lymphocytes, and macrophages, which phagocytose and destroy microbes. [1]
Cytokine barriers: virus-infected cells secrete interferons, which protect non-infected cells from further viral infection. [1]

Q13. (3 marks) Answer: reverse transcriptase; macrophages; helper T-cells decrease; opportunistic infections.
HIV enters macrophages; its RNA genome is copied into viral DNA by the enzyme reverse transcriptase, and this DNA is incorporated into the host cell's DNA, so the infected cells keep producing virus particles (macrophages act as an HIV factory). [1]
HIV then enters helper T-lymphocytes, replicates and produces progeny viruses, which attack other helper T-lymphocytes; their number falls progressively. [1]
The person suffers from fever, diarrhoea and weight loss; as the immune system weakens, he cannot fight even infections by bacteria such as Mycobacterium, viruses, fungi and parasites such as Toxoplasma (opportunistic infections). [1]

Q14. (3 marks) Answer: confined vs invasive; spread through blood; biopsy, CT, MRI.
Benign tumours remain confined to their original location, do not spread and cause little damage. Malignant tumours are masses of proliferating cells (neoplastic or tumour cells) that grow very fast, invade and damage surrounding normal tissues. [1]
Metastasis: cells sloughed from malignant tumours reach distant sites through the blood, and start a new tumour wherever they lodge. [1]
Any two: biopsy and histopathological studies of the tissue; blood and bone marrow tests (for leukaemias); radiography (X-rays), CT and MRI; antibodies against cancer-specific antigens; molecular biology techniques to detect cancer-related genes. [1]

Q15. (4 marks) Answer: (I) falling marks, absence, withdrawal; (II) liver cirrhosis, nervous damage; (III) counselling, or withdrawal symptoms.
(I) Any two: drop in academic performance; unexplained absence from school; lack of interest in personal hygiene; withdrawal, isolation; aggressive and rebellious behaviour; deteriorating relationships with family and friends; loss of interest in hobbies. [1]
(II) Any two: damage to the nervous system and liver (cirrhosis); reckless behaviour, vandalism and violence; coma and death from overdose (respiratory failure, heart failure or cerebral haemorrhage); those who inject drugs risk infections like AIDS and hepatitis B; drug use in pregnancy affects the foetus. [2]
(III) Any one: avoid undue peer pressure; education and counselling; seeking help from parents and peers; looking for danger signs; seeking professional and medical help. [1]
OR (III) The characteristic and unpleasant symptoms (anxiety, shakiness, nausea, sweating) that appear when a dependent person abruptly stops the regular dose of the drug or alcohol. [1]

Q16. (5 marks) Answer: (a) Salmonella typhi, Streptococcus pneumoniae, Entamoeba, Ascaris, Microsporum etc.; (b) sporozoites → liver → RBC (haemozoin) → gametocytes → mosquito.

(a) (i) Typhoid: Salmonella typhi; contaminated food and water; sustained high fever (39–40 °C), weakness, stomach pain, loss of appetite. [1] (ii) Pneumonia: Streptococcus pneumoniae and Haemophilus influenzae; inhaling droplets released by an infected person, or sharing glasses and utensils; fever, chills, cough, headache; in severe cases lips and fingernails turn grey to bluish. [1] (iii) Amoebiasis (amoebic dysentery): Entamoeba histolytica; houseflies carry the parasites to food and water; constipation, abdominal pain, cramps, stools with excess mucus and blood clots. [1] (iv) Ascariasis: Ascaris (roundworm); eggs passed in the faeces contaminate soil, water, plants, and are taken in with food and water; internal bleeding, muscular pain, fever, anaemia, blockage of the intestinal passage. [1] (v) Ringworm: fungi such as Microsporum, Trichophyton and Epidermophyton; from soil or by using towels, clothes or combs of infected persons; dry, scaly lesions on the skin, nails and scalp with intense itching. [1]

OR (b) Plasmodium enters the human body as sporozoites, through the bite of an infected female Anopheles mosquito. [1] The parasites first multiply in the liver cells and then attack the red blood cells, multiplying there and causing their rupture. [1] The rupture of RBCs releases a toxic substance, haemozoin, which causes the chill and high fever recurring every three to four days. [1] Some parasites develop into gametocytes in the blood; when a female Anopheles bites an infected person, they enter the mosquito and fertilisation and development take place in its stomach. [1] The sporozoites formed move to the salivary glands of the mosquito, and are passed on to a human when it bites. [1]

Q17. (5 marks) Answer: (a) H_2L_2; IgA, IgM, IgE, IgG; B-cells vs T-cells; graft rejection; (b) primary and secondary lymphoid organs; MALT.

(a) An antibody is made of four polypeptide chains — two small light chains and two longer heavy chains (H_2L_2), forming a Y shape, with antigen-binding sites at the tips of the arms. [1½] Types: IgA, IgM, IgE, IgG. [1] The humoral response is mediated by antibodies produced by B-lymphocytes and present in the blood; the cell-mediated response is mediated by T-lymphocytes. [1½] The body can tell 'self' from 'non-self'; the cell-mediated response recognises a transplanted tissue or organ as foreign and rejects it, so tissue and blood group matching is needed and the patient takes immunosuppressants for life. [1]

OR (b) Primary lymphoid organs — the bone marrow and the thymus — are where immature lymphocytes differentiate into antigen-sensitive lymphocytes. [1] The bone marrow is the main lymphoid organ where all blood cells, including lymphocytes, are produced; the thymus, a lobed organ near the heart, is large at birth and shrinks with age, and is the site of maturation of T-lymphocytes. [1] Secondary lymphoid organs — the spleen, lymph nodes, tonsils, Peyer's patches of the small intestine and the appendix — are where lymphocytes interact with antigens and proliferate into effector cells. [1] The spleen filters the blood (and stores erythrocytes); lymph nodes trap microbes and antigens in the lymph. [1] Mucosa-associated lymphoid tissue (MALT), in the linings of the respiratory, digestive and urogenital tracts, makes up about 50 % of the lymphoid tissue in the human body. [1]

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