

Human Health and Disease — Assignment 2

Class 12 Biology · Higher-difficulty challenge set + integrated problems · Answer key included · Narayan Gurukul Academy

Instructions: (1) Attempt all questions; start with the topic-wise challenge set, then attempt the integrated (multi-topic) problems.
(2) Give all answers with correct SI units. $g = 10 \text{ m/s}^2$ unless stated.
(3) A final answer key is provided at the end — try the full set before checking it.

Part A — Topic-wise challenge questions

Common Diseases and Their Pathogens

1. Name the pathogen of malaria.
2. Name the pathogen and vector of filariasis.
3. List the common diseases and their pathogens.

Immunity — Types and Mechanisms

1. What is immunity?
2. Differentiate between innate and acquired immunity.
3. Explain the types of acquired immunity.

Vaccination, Allergies and Autoimmunity

1. What is vaccination?
2. How does vaccination work?
3. Describe allergies and autoimmunity with examples.

Cancer — Causes and Detection

1. What is cancer?
2. How is cancer detected?
3. Explain the detection and treatment of cancer.

AIDS — HIV and Prevention

1. What is AIDS?
2. How is AIDS transmitted?
3. Describe the replication of HIV in the human body.

Drugs and Alcohol Abuse

1. What is drug abuse?
2. State two measures for the prevention of drug abuse.
3. Describe the effects of drug and alcohol abuse.

Part B — Integrated problems (multi-topic)

1. Describe the various types of immunity with examples.
2. Describe the causes, detection and treatment of cancer.
3. Explain AIDS — its cause, transmission and prevention.
4. Explain the process of vaccination and the role of memory cells.
5. Describe the barriers of innate immunity.
6. Describe the effects of drug and alcohol abuse and their prevention.

Answer Key

Common Diseases and Their Pathogens

Malaria — Plasmodium (vector: Anopheles); typhoid — Salmonella typhi; filariasis — Wuchereria; ringworm — fungi; AIDS — HIV.

Immunity — Types and Mechanisms

Innate: present at birth, non-specific (physical, physiological, cellular, cytokine barriers). Acquired: specific with memory, active or passive, involving B and T cells.

Vaccination, Allergies and Autoimmunity

Vaccination introduces a weakened antigen to produce antibodies and memory cells. Allergies involve IgE; autoimmunity is immunity against self (rheumatoid arthritis).

Cancer — Causes and Detection

Uncontrolled division; benign (confined) vs malignant (metastatic); carcinogens are the causes; detected by biopsy/CT/MRI; treated by surgery, radiation and chemotherapy.

AIDS — HIV and Prevention

HIV uses reverse transcriptase to make DNA, integrates into the host genome and destroys helper T cells; transmitted by unsafe sex, infected blood and mother to child; diagnosed by ELISA.

Drugs and Alcohol Abuse

Affect the nervous system and cause addiction and organ damage; prevented by awareness, counselling, parental care and a healthy lifestyle.

Integrated problems

1: Innate and acquired immunity with barriers and lymphocytes. 2: Carcinogens → benign/malignant → biopsy → treatment. 3: HIV → reverse transcriptase → DNA → helper T-cell destruction. 4: Antigen → antibodies + memory → protection. 5: Physical, physiological, cellular, cytokine. 6: Addiction and organ damage; prevention by awareness and counselling.