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VCE Biology ¾

Introduction to Immunity [3.1]

Test Solutions

11 Marks. 1 Minute Reading. 9 Minutes Writing.

Results:

Test Questions	_____ / 11

Section A: Test Questions (11 Marks)

Question 1 (5 marks)

Tick whether the following statements are **true** or **false**.

Statement	True	False
a. Diseases can only be caused by pathogenic agents.		✓
False (Diseases can also be non-pathogenic, such as genetic or autoimmune diseases.)		
b. Viruses are considered living organisms.		✓
False (Viruses are non-cellular and considered non-living because they require a host cell to replicate.)		
c. Bacteria cause disease primarily by releasing toxins and enzymes.	✓	
d. Protozoa are single-celled prokaryotes that cause disease.		✓
False (Protozoa are single-celled eukaryotes.)		
e. Major Histocompatibility Complex (MHC) Class I proteins are only found in specialised immune cells.		✓
False (MHC Class I proteins are found on all nucleated cells.)		
f. Allergies occur when the immune system mistakenly identifies non-pathogenic substances as threats.	✓	
g. Prion diseases result from genetic mutations rather than misfolded proteins.		✓
False (Prion diseases result from misfolded proteins.)		
h. Plants have microbiological barriers involving beneficial microbes to protect against pathogens.	✓	
i. Antigens are molecules that cannot be recognised by the immune system.		✓
False (Antigens are specifically recognised by the immune system.)		
j. Stomach acid acts as a chemical barrier in animals by creating an environment that destroys pathogens.	✓	

Question 2 (1 mark)

An individual accidentally ingests contaminated food with harmful bacteria. Despite exposure, no illness occurs because bacteria fail to survive a particular body barrier. Which animal chemical barrier is primarily responsible for preventing this infection?

A. Lysozyme enzymes found in tears and saliva, dissolving bacterial cell walls.

B. Stomach acid creating a low pH environment, destroying ingested bacteria.

C. Antimicrobial peptides on skin surfaces neutralising pathogens.

D. Cilia present in respiratory pathways sweeping away pathogens.

Question 3 (1 mark)

Healthy human skin is colonised by normal flora, significantly reducing pathogen infections through competitive exclusion. If antibiotics eliminate these normal florae, which of the following is most likely to occur?

A. Increased pathogen colonisation due to reduced microbial competition.

B. Increased physical damage to the epidermis.

C. Enhanced chemical barrier effectiveness of sweat.

D. Improved physical barrier protection through thicker keratin layers.

Question 4 (1 mark)

An allergen like pollen typically triggers immune reactions in some individuals but not others. The fundamental immunological error responsible for allergic reactions occurs because:

A. Self-antigens are incorrectly recognised as harmful.

B. The immune system mistakes harmless non-self-antigens as threatening.

C. Non-self-antigens fail to stimulate an immune response.

D. Non-cellular pathogens like pollen replicate uncontrollably within host cells.

Space for Personal Notes

Question 5 (1 mark)

A person suffers from a prion disease after consuming contaminated meat. The infectious nature of prions is explained best by:

A. Their ability to integrate genetic material into host DNA, causing persistent replication.

B. The production of toxins damaging host neural tissue.

C. Their ability to induce normal host proteins to misfold, spreading cellular dysfunction.

D. A rapid replication cycle causing cell lysis in neural tissue.

Question 6 (1 mark)

A plant pathogen successfully infects and begins spreading within leaf tissues. In response, the plant rapidly initiates localised cell death around the infection site, forming a protective structure. What physical barrier mechanism is this describing?

A. Formation of a waxy cuticle to block water penetration.

B. Formation of galls to isolate and restrict pathogen spread.

C. Rapid closure of stomata to limit pathogen entry.

D. Orientation of leaves to minimise surface moisture accumulation.

Question 7 (1 mark)

" A toxin or other foreign substance which induces an immune response in the body."

The definition above refers to:

A. Antigen

B. Pathogen

C. Antibody

D. Antibiotic

Explanation: Option B is usually an organism or non-cellular agent. Option C is the result of an immune response. Option D is a chemical which inhibits bacterial reproduction.

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