

Grade: L3 Biochemistry

Name:.....

Duration: 90 minutes

Group:.....

Date: 11/05/2025

Scientific English Exam

Oxidative stress is a biochemical condition that arises when there is an imbalance between the production of reactive oxygen species (ROS) and the body's capacity to neutralize or eliminate them through antioxidant defenses. ROS, such as superoxide anion, hydrogen peroxide, and hydroxyl radicals, are highly reactive molecules generated during normal cellular respiration, particularly in the mitochondria. While small amounts of ROS play essential roles in cellular signaling and immune defense, excessive ROS can cause oxidative damage to lipids, proteins, and DNA. This damage can alter membrane structure, inactivate enzymes, and cause mutations that may lead to cancer, neurodegenerative diseases like Alzheimer's and Parkinson's, cardiovascular problems, and accelerated aging. To protect itself, the body employs a complex antioxidant system, including enzymatic antioxidants like superoxide dismutase (SOD), catalase, and glutathione peroxidase, and non-enzymatic antioxidants such as vitamins C and E, glutathione, flavonoids, and other dietary compounds. These antioxidants work together to neutralize ROS and maintain redox balance in cells. Oxidative stress can be triggered or worsened by external factors such as air pollution, ultraviolet (UV) radiation, smoking, alcohol consumption, exposure to toxins, certain medications, and even intense physical or psychological stress.

Questions:

Part one. Comprehension

Answer the following questions according to the text:

What type of scientific text is this? **Explanatory (1Mark)**

Mention two harmful effects of oxidative stress on cells.

-Alter membrane structure, inactivate enzymes.(1.5 Mark)

-Cause mutations that may lead to cancer, neurodegenerative diseases like Alzheimer's and Parkinson's. (1.5 Mark)

Identify one antioxidant enzyme and one environmental cause of oxidative stress:

A. Vitamin C and a healthy diet

B. Superoxide dismutase and radiation (1Marks)

C. Flavonoids and alcohol consumption

D. Smoking and protein synthesis

True or False:

- Oxidative stress only occurs due to internal body processes. **False (1Mark)**
- Antioxidants help neutralize reactive oxygen species. **True (1Mark)**
- ROS are always harmful and have no useful functions in the body. **False (1Mark)**

5. Choose the correct synonym from the text:

- a/ Instability = **imbalance(1Mark)**
- b/ Excessive = **intense (1Mark)**

1/1

Section 2: Grammar

A. Multiple-choice questions on tenses: Choose the correct tense

1. Scientists (study) oxidative stress and its effects on aging for many years. **(1Mark)**

- A. study
- B. have studied**
- C. will study
- D. studies

2. In the 20th century, researchers (link) oxidative damage to various diseases. **(1Mark)**

- A. links
- B. linked**
- C. will link
- D. linking

3. By next year, new antioxidant treatments (be) available for testing. **(1Mark)**

- A. will be**
- B. are
- C. is
- D. was

B. Rewrite the following sentences as directed:

Researchers are developing new drugs to reduce oxidative stress. (Rewrite in passive voice)/**New drugs are being developed by researchers to reduce oxidative stress. (1Mark)**

Oxidative stress has triggered many chronic diseases. (Rewrite in the past perfect tense)/**Oxidative stress had triggered many chronic diseases. (1Mark)**

Oxidative stress is harmful; the body has defense mechanisms to control it. (Combine using a conjunction)/ **Although oxidative stress is harmful, the body has defense mechanisms to control it. (1Mark)**

Section 3: Writing

Choose one of the following topics and write a short paragraph (60-120 words). Use appropriate scientific terminology, correct tenses, and conjunctions. (2 Marks)

Describe the beneficial effects of natural antioxidants on human health.

Write about a biochemical topic of your choice.

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Note: Two marks were assigned for the PPT presentation.

Lecturer: Hadjab W