Enriched Air Nitrox (SC-EAN) Practice Test (Sample)

Study Guide

BY EXAMZIFY

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Questions

1. **What type of environment should be avoided when filling EANx tanks?**
   - **A. Contaminated or uncontrolled environments that could introduce oil or other impurities**
   - **B. Well-ventilated areas with high humidity**
   - **C. Open water surfaces**
   - **D. Private home garages**

2. **What does the term "partial pressure of oxygen" refer to in diving with EANx?**
   - **A. The total pressure contributed by all gases in the mixture**
   - **B. The portion of the total pressure that is contributed by oxygen in the gas mixture**
   - **C. The average pressure of all gases in the dive environment**
   - **D. The pressure at which oxygen is delivered to the body**

3. **Why should you add percentages together when tracking your CNS exposure during multiple dives?**
   - **A. Because it ensures you stay within the safe limits**
   - **B. To calculate maximum depth for the next dive**
   - **C. To reduce surface interval time**
   - **D. For ascent safety**

4. **Name a physiological effect of using EANx at depth.**
   - **A. Decreased nitrogen absorption**
   - **B. Reduced breathing rates**
   - **C. Enhanced oxygen uptake leading to increased potential for hyperoxia**
   - **D. Increased carbon dioxide buildup**

5. **Why is pre-dive gas analysis important for EANx diving?**
   - **A. To ensure the gas is warm enough**
   - **B. To confirm the gas mixture is within safe limits**
   - **C. To check for color coding of the tank**
   - **D. To measure the weight of the tank**

6. What should divers do before venturing on a dive using Nitrox?

A. Check the weather

B. Review dive tables and profiles

C. Analyze the cylinder contents

D. Practice emergency drills

7. Why is it important to consult dive tables specifically designed for Nitrox?

A. To account for different nitrogen absorption rates and no-decompression limits based on the gas mix used

B. To help choose the right dive instructor

C. To plan for advanced dive techniques

D. To simplify dive planning processes

8. How can the ppO2 of a breathing gas be calculated?

A. Divide ambient pressure by the fraction of oxygen (FO2)

B. Multiply cylinder pressure by the fraction of nitrogen (FN2)

C. Multiply air pressure by the fraction of oxygen (FO2)

D. Multiply ambient pressure by the fraction of oxygen (FO2)

9. At deeper depths, what factor significantly changes when using Nitrox compared to traditional air?

A. Increased level of nitrogen absorption

B. Increased partial pressure of oxygen

C. Overall buoyancy

D. Rate of ascent

10. What is the most noticeable and immediate effect of oxygen toxicity?

A. Central nervous system and feet

B. Lungs and circulation system

C. Lungs and central nervous system

D. Bones and blood

Answers

1. A
2. B
3. A
4. C
5. B
6. C
7. A
8. D
9. B
10. C

Explanations

1. What type of environment should be avoided when filling EANx tanks?

A. Contaminated or uncontrolled environments that could introduce oil or other impurities

B. Well-ventilated areas with high humidity

C. Open water surfaces

D. Private home garages

When filling Enriched Air Nitrox (EANx) tanks, it is crucial to avoid contaminated or uncontrolled environments because these settings can introduce oil, dirt, or other impurities into the tanks. EANx contains a higher percentage of oxygen than regular air, and contaminants such as oil can pose serious safety risks. Oil and high concentrations of oxygen can react in hazardous ways, increasing the risk of fire or explosion. Ensuring a clean and controlled filling environment is essential to maintain the integrity of the gas and prevent potential accidents. The other environments mentioned do not present the same level of risk. For instance, well-ventilated areas with high humidity are generally safe if the humidity does not lead to water contamination. Open water surfaces and private home garages can also be safe under the right conditions, though precautions should still be taken to ensure they are free from contaminants. Maintaining a clean environment is a key operational safety practice when handling gases enriched with oxygen.

2. What does the term "partial pressure of oxygen" refer to in diving with EANx?

A. The total pressure contributed by all gases in the mixture

B. The portion of the total pressure that is contributed by oxygen in the gas mixture

C. The average pressure of all gases in the dive environment

D. The pressure at which oxygen is delivered to the body

The term "partial pressure of oxygen" specifically refers to the portion of the total pressure in a gas mixture that is due to the presence of oxygen. In the context of diving with Enriched Air Nitrox (EANx), this concept is crucial for understanding how the body absorbs and utilizes oxygen under pressure. When divers are exposed to different depths, the total pressure increases due to the weight of the water above them. Each gas in the mixture, including oxygen, exerts pressure in proportion to its concentration. The partial pressure of oxygen is thus calculated by multiplying the fraction of oxygen in the mixture by the total pressure at the given depth. This value is important for assessing the risk of oxygen toxicity, as increased partial pressures beyond certain limits can lead to adverse effects on the body. Recognizing the role of partial pressure allows divers to plan their dives safely, ensuring that they remain within safe operating limits when using EANx. This understanding helps in avoiding both hypoxia (insufficient oxygen) at shallower depths and hyperoxia (excess oxygen) at deeper depths, promoting safe diving practices.

3. Why should you add percentages together when tracking your CNS exposure during multiple dives?

A. Because it ensures you stay within the safe limits

B. To calculate maximum depth for the next dive

C. To reduce surface interval time

D. For ascent safety

Adding percentages together when tracking your Central Nervous System (CNS) exposure during multiple dives is essential because it helps ensure that you stay within the safe limits established for oxygen exposure. This is particularly important when using Enriched Air Nitrox, which contains a higher concentration of oxygen than regular air. Oxygen has a toxicity effect that increases with pressure and exposure time. When you conduct multiple dives using Nitrox, each dive contributes to your cumulative CNS oxygen exposure. By aggregating the percentages, you can monitor your total exposure against the safety thresholds, which helps prevent potential neurological effects related to oxygen toxicity. Using this method allows divers to maintain awareness of their cumulative exposure, assisting in making informed decisions about future dives while minimizing the risks associated with excessive oxygen levels. This practice is crucial for diver safety and overall health during repetitive dives.

4. Name a physiological effect of using EANx at depth.

A. Decreased nitrogen absorption

B. Reduced breathing rates

C. Enhanced oxygen uptake leading to increased potential for hyperoxia

D. Increased carbon dioxide buildup

Using Enriched Air Nitrox (EANx), which contains a higher percentage of oxygen than regular air, can lead to enhanced oxygen uptake at depth. This physiological effect is significant because deeper dives increase the partial pressure of gases, including oxygen, which can lead to greater oxygen availability in the lungs and thus more efficient oxygen uptake into the bloodstream. However, this increased oxygen exposure at depths also poses a risk of hyperoxia, a condition that results from having too much oxygen in the body, which can be detrimental to divers. The risk of hyperoxia rises as the diver descends deeper and the partial pressure of oxygen increases, potentially leading to symptoms ranging from visual disturbances to seizures. While decreased nitrogen absorption is a benefit of using EANx compared to regular air, the direct physiological effect at depth pertains more to oxygen and the risk of hyperoxia. Reduced breathing rates and increased carbon dioxide buildup are also physiological effects, but they are not directly linked to the specific impact of using EANx at depth in the same way that increased oxygen uptake is. Therefore, the correct choice focuses on the critical relationship between oxygen exposure and depth in EANx diving.

5. Why is pre-dive gas analysis important for EANx diving?

A. To ensure the gas is warm enough

B. To confirm the gas mixture is within safe limits

C. To check for color coding of the tank

D. To measure the weight of the tank

Pre-dive gas analysis is crucial for EANx diving primarily to confirm that the gas mixture is within safe limits. This involves analyzing the percentage of oxygen and nitrogen in the diving gas to ensure that it aligns with the specifications for the planned dive. Each diver has to consider their maximum operating depth (MOD) based on the oxygen percentage in their gas mix to prevent oxygen toxicity, particularly at greater depths. By confirming the gas composition, divers safeguard against potential hazards associated with inappropriate mixes, such as hypoxia or oxygen toxicity. Knowing the exact percentages allows divers to calculate their dive profiles safely and make informed choices about their dive plans. Ensuring that the mix is safe is fundamental to maintaining diver safety and health during the dive. Other factors, such as tank weight or even the temperature of the gas, are not as essential to the immediate safety and effectiveness of the dive as analyzing the gas composition itself.

6. What should divers do before venturing on a dive using Nitrox?

A. Check the weather

B. Review dive tables and profiles

C. Analyze the cylinder contents

D. Practice emergency drills

Before embarking on a dive using Nitrox, analyzing the cylinder contents is crucial for several reasons. Nitrox blends generally have higher concentrations of oxygen compared to air, and knowing the exact mixture is vital for safe diving. Each cylinder must be analyzed to ensure that the mix is appropriate for the planned dive depth and duration, as exceeding the maximum operating depth for a specific Nitrox blend can lead to oxygen toxicity, which can have serious consequences such as convulsions underwater. It's important to have the precise information regarding the oxygen percentage in the cylinder to accurately plan the dive and manage decompression schedules effectively. Additionally, divers need to familiarize themselves with the associated no-decompression limits based on the specific Nitrox blend they intend to use for the dive. By analyzing the cylinder before diving, divers can help ensure their safety and enhance their overall diving experience.

7. Why is it important to consult dive tables specifically designed for Nitrox?

A. To account for different nitrogen absorption rates and no-decompression limits based on the gas mix used

B. To help choose the right dive instructor

C. To plan for advanced dive techniques

D. To simplify dive planning processes

Consulting dive tables specifically designed for Nitrox is crucial because these tables take into account the unique properties and behaviors of different gas mixtures, particularly the varying nitrogen absorption rates and no-decompression limits associated with those mixtures. Nitrox typically has a higher concentration of oxygen and a reduced amount of nitrogen compared to regular air. This alteration affects how divers absorb nitrogen and the amount of time they can spend at specific depths without exceeding safe no-decompression times. Using the appropriate Nitrox dive tables ensures divers are following safe practices tailored to their specific gas mixture, which is vital for avoiding decompression sickness. Regular dive tables designed for air do not accommodate these differences and could lead to unsafe dive profiles if Nitrox is used without the proper calculations. The other options do not directly address this important safety consideration related to gas mixtures and their effects on decompression limits.

8. How can the ppO2 of a breathing gas be calculated?

A. Divide ambient pressure by the fraction of oxygen (FO2)

B. Multiply cylinder pressure by the fraction of nitrogen (FN2)

C. Multiply air pressure by the fraction of oxygen (FO2)

D. Multiply ambient pressure by the fraction of oxygen (FO2)

To calculate the partial pressure of oxygen (ppO2) in a breathing gas, you need to consider the total ambient pressure and the fraction of oxygen in that gas mixture. The formula for partial pressure is derived from Dalton's Law of Partial Pressures, which states that in a gas mixture, the total pressure is the sum of the partial pressures of the individual gases. When using this principle, the appropriate calculation involves multiplying the ambient pressure (which is the total pressure exerted by the atmosphere or the pressure in a diving environment) by the fraction of oxygen (FO2) in the breathing gas. This results in the ppO2, providing the effective pressure of oxygen available for respiration. In contrast, dividing ambient pressure by the fraction of oxygen would yield an incorrect value, as it does not reflect the direct relationship needed for calculating partial pressure. Similarly, multiplying cylinder pressure by the fraction of nitrogen does not pertain to calculating ppO2, as this would factor in nitrogen instead of oxygen. Lastly, multiplying air pressure by the fraction of oxygen confuses the context since air pressure typically refers to ambient pressure, emphasizing the necessity of clarifying which pressures and fractions are being used in the calculation. Thus, the correct method is to multiply ambient pressure by

9. At deeper depths, what factor significantly changes when using Nitrox compared to traditional air?

A. Increased level of nitrogen absorption

B. Increased partial pressure of oxygen

C. Overall buoyancy

D. Rate of ascent

Using enriched air nitrox at greater depths significantly affects the partial pressure of oxygen, making this the correct answer. Unlike regular air, which is composed of approximately 21% oxygen and 79% nitrogen, nitrox blends typically have higher oxygen concentrations. As a diver descends, the surrounding pressure increases, and this increased pressure affects the partial pressure of gases.   For nitrox divers, the higher proportion of oxygen means that as they go deeper, the partial pressure of oxygen rises more rapidly than it would with air. This can have physiological implications, such as an increased risk of oxygen toxicity if the partial pressure of oxygen exceeds certain thresholds.   Understanding this change is crucial for divers, as it influences the planning of depth and duration of dives when using nitrox, as well as the need for careful monitoring of oxygen exposure during the dive. Managing the risks associated with increased partial pressures of oxygen helps ensure the safety of dives conducted with enriched air nitrox.

10. What is the most noticeable and immediate effect of oxygen toxicity?

A. Central nervous system and feet

B. Lungs and circulation system

C. Lungs and central nervous system

D. Bones and blood

The most noticeable and immediate effect of oxygen toxicity primarily impacts the central nervous system. When divers breathe high concentrations of oxygen, particularly under increased pressures, it can lead to a condition known as central nervous system oxygen toxicity. Symptoms may include visual disturbances, auditory changes, and physical symptoms such as muscle twitching or seizures. While the lungs can also be affected by oxygen toxicity, particularly with prolonged exposure to high partial pressures of oxygen, the acute effects that are most immediately noticeable are those related to the central nervous system. Understanding this distinction is crucial for divers, as it helps in recognizing the signs of oxygen toxicity early and taking appropriate measures to mitigate risks.   Other bodily systems mentioned, such as the feet or the bones, do not experience immediate effects from oxygen toxicity, nor do they typically exhibit symptoms related to changes in oxygen levels. Therefore, focusing on the central nervous system's role in this scenario is essential for recognizing potential dangers in enriched air nitrox diving practices.