
Q692 - Engineering Safety & Environmental Protection

1. Static water pressure on the hull of a ship is greatest at the _____.

- boot topping
- stern
- bow
- **keel**

Note:
Static water pressure increases with depth; therefore, the keel, being the deepest point on the hull, experiences the greatest pressure.

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2. If deck cargo is carried, it should be stowed so that it _____.

- is not higher than 12 inches above the deck
- will be easily visible from the bridge
- **does not block access to the fire station hydrant**
- will cover less than 25 percent of deck space

Note:
Deck cargo must be stowed to ensure unobstructed access to firefighting equipment, specifically fire station hydrants, to maintain immediate readiness in emergency situations.

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3. Before entering any space that has been sealed, its oxygen level should be tested. What level of oxygen in the space is equal to fresh air?

- 10.0%
- 15.8%
- **20.8%**
- 25.8%

Note:
Fresh air contains approximately 20.8% oxygen by volume; therefore, a space should have 20.8% oxygen to be considered equivalent to fresh air.

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4. How does good housekeeping prevent fires on a vessel?

- Allowing better access in an emergency
- Improving personnel qualifications
- **Eliminating potential fuel sources**
- Eliminating trip hazards

Note:
Good housekeeping prevents fires by eliminating potential fuel sources, directly addressing the 'fuel' component of the fire triangle. Fire prevention focuses on controlling fuel and ignition sources, and good housekeeping practices like cleaning spills and properly storing combustibles reduce the risk of fire ignition or spread. Options related to emergency access, personnel qualifications, and trip hazards address safety and response, not primary fire prevention.

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5. A burning mattress is considered as which of the following classes of fire?

- **Class "A"**
- Class "B"
- Class "C"
- Class "D"

Note:
A burning mattress is classified as a Class A fire because it is composed of ordinary combustible solids like cloth and foam, which aligns with the definition of Class A fires involving materials such as wood and paper.

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6. A fire in a pile of dunnage would be classified as a _____.

- **class "A"**
- class "B"
- class "C"
- class "D"

Note:
Dunnage, typically wood, is an ordinary combustible material and therefore classified as a Class A fire, which involves wood, paper, textiles, and rubbish.

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7. The class of fire on which a blanketing effect is essential to extinguish the fire is _____.

- class "A"
- **class "B"**
- class "C"
- class "D"

Note:
A blanketing effect is essential for extinguishing Class B fires, which involve flammable liquids and gases. This technique separates the fuel from oxygen, suppressing vapors and preventing re-ignition.

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8. A magnesium fire is classified as class _____.

- Class A
- Class B
- Class C
- **Class D**

Note:
Magnesium fires are classified as Class D because magnesium is a combustible metal. Class D fires specifically involve combustible metals like magnesium, while Class A covers ordinary combustibles, Class B covers flammable liquids and gases, and Class C covers energized electrical equipment.

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9. The process that occurs when heat is generated by a chemical reaction within a substance and continues to a point of ignition is known as _____.

- **spontaneous combustion**
- chemical combustion
- radiation ignition
- chemical ignition

Note:
Spontaneous combustion is the correct term; it describes ignition resulting from heat generated by internal chemical reactions without an external ignition source. This process occurs when heat buildup exceeds dissipation, leading to ignition temperature. The term distinguishes itself from other options by specifically denoting self-heating and ignition without external factors, unlike chemical combustion, radiation ignition, or chemical ignition.

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10. Which of the conditions listed is necessary for a substance to burn?

- The temperature of the substance must be equal to or above its fire point
- The mixture of vapors with air must be between the LEL and the UEL
- The air must contain oxygen in sufficient quantity
- **All of the above**

Note:
Combustion requires sufficient heat to reach the fire point, a vapor/air mixture within the explosive limits (LEL and UEL), and adequate oxygen. Therefore, all listed conditions are necessary for a substance to burn.
