Intro to Wildland Fire Behavior (S-190) Practice Test (Sample)

Study Guide

Everything you need from our exam experts!

Questions

1. What does a sudden calm in wind conditions indicate during fire assessment?

A. Stable weather

B. Possible wind change

C. Increased visibility

D. Effective fire suppression

2. What is a sign that inversion might be lifting during a fire?

A. Thick layers of fog

B. Smoke rising straight up

C. Heavy rainfall

D. Steady winds from one direction

3. How does the duration of precipitation impact fuel moisture compared to precipitation amount?

A. Duration is less impactful than amount

B. Duration has a greater impact than amount

C. They impact fuel moisture equally

D. Duration only matters in urban areas

4. What effect does wind have when passing through a saddle or pass in a mountain range?

A. It decreases in speed

B. It remains unchanged

C. It increases in speed and may create eddy action

D. It disperses evenly

5. What type of winds are considered surface winds that significantly affect fire behavior?

A. Winds below 5 mph

B. Winds around 10 mph

C. Winds above 15 mph

D. Calm winds

6. What happens to surface winds during unstable atmospheric conditions?

- **A. They tend to be steady and mild**
- **B. They can become gusty and turbulent**
- **C. They remain unaffected by thermal conditions**
- **D. They generally strengthen**

7. What are pockets of a fire?

- **A. Areas where flames are intensely concentrated**
- **B. Long narrow extensions of the main fire**
- **C. Unburned indentations formed by fingers or slow burning areas**
- **D. Fire ignited outside the main perimeter**

8. What primarily influences fire spread on slopes?

- **A. Moisture content of the air**
- **B. The degree of incline of the hillside**
- **C. The type of vegetation present**
- **D. The ambient temperature**

9. How is creeping fire defined?

- **A. Fire that advances quickly with a well-defined head**
- **B. Fire burning with a low flame and spreading slowly**
- **C. Spinning vortex column of hot air and gases**
- **D. Any sudden acceleration in the rate of spread**

10. What does low relative humidity generally indicate regarding fuel?

- **A. Higher moisture content in fine fuels**
- **B. Increased fire spread potential**
- **C. Lower chances of ignition**
- **D. More dense vegetation cover**

Answers

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

Explanations

1. What does a sudden calm in wind conditions indicate during fire assessment?

A. Stable weather

B. Possible wind change

C. Increased visibility

D. Effective fire suppression

A sudden calm in wind conditions is often indicative of a possible wind change. In the context of fire behavior, winds play a crucial role in the spread and intensity of a fire. When there is a noticeable calmness in the wind, it can signal that a shift in atmospheric pressure may be occurring, which could lead to changing wind directions or speeds. This change can significantly impact a fire's behavior, potentially causing it to spread unpredictably. Firefighters and those assessing fire conditions need to be vigilant during such moments, as the calm may precede more turbulent winds or erratic fire behavior. By recognizing this signal, fire personnel can prepare for potential hazards that may arise from sudden shifts in the fire environment. Understanding this concept is essential for effective fire assessment and strategy development to ensure safety and operational success in firefighting efforts.

2. What is a sign that inversion might be lifting during a fire?

A. Thick layers of fog

B. Smoke rising straight up

C. Heavy rainfall

D. Steady winds from one direction

The indication that inversion might be lifting during a fire is smoke rising straight up. When a temperature inversion is present, it traps cooler air near the ground beneath a layer of warmer air, which prevents smoke and heat from rising effectively. If the inversion begins to lift, the smoke will no longer be confined and will rise vertically, signifying that the atmospheric conditions are changing and that the fire may receive more oxygen and more favorable burning conditions. In contrast, thick layers of fog typically suggest that moisture may be present in the air, which can also be associated with stable atmospheric conditions and not necessarily indicate a lifting inversion. Heavy rainfall can suppress fire activity and would not typically be associated with inversion lifting. Steady winds from one direction can affect fire behavior but do not directly indicate changes in the presence or lifting of an inversion layer.

3. How does the duration of precipitation impact fuel moisture compared to precipitation amount?

A. Duration is less impactful than amount

B. Duration has a greater impact than amount

C. They impact fuel moisture equally

D. Duration only matters in urban areas

The correct answer indicates that the duration of precipitation has a greater impact on fuel moisture than the amount of precipitation. This is because longer-lasting rain events allow water to penetrate deeper into the fuel materials, such as grasses, shrubs, and forest litter, effectively increasing their moisture content. When precipitation occurs over an extended period, the soil and vegetation have more time to absorb the moisture, which results in a more significant and lasting effect on fuel moisture levels. In contrast, heavy short-duration rain may lead to surface runoff, preventing moisture from adequately penetrating and saturating the fuels. Therefore, while the quantity of rain is certainly important, its duration is critical in determining how much moisture actually reaches and affects the fuels, which can ultimately influence fire behavior.

4. What effect does wind have when passing through a saddle or pass in a mountain range?

A. It decreases in speed

B. It remains unchanged

C. It increases in speed and may create eddy action

D. It disperses evenly

When wind passes through a saddle or pass in a mountain range, the terrain constricts the airflow, leading to an increase in wind speed. This phenomenon occurs because as the wind moves from a wider area into a narrower passage, the same volume of air must move through a reduced space, which causes it to accelerate. Additionally, the complexities of the terrain can result in turbulent flow, often referred to as eddy action, where the wind can swirl in various directions. This increased speed and potential turbulent behavior can significantly impact fire behavior by contributing to the rapid spread of flames and smoke, making this characteristic of wind in mountain passes particularly critical for fire management and suppression strategies.

5. What type of winds are considered surface winds that significantly affect fire behavior?

A. Winds below 5 mph

B. Winds around 10 mph

C. Winds above 15 mph

D. Calm winds

Winds around 10 mph are significant for influencing fire behavior because they can enhance fire spread and intensity while still being manageable for fire operations. At this speed, surface winds can help carry flames and embers, increasing the overall rate of spread of a fire. They can also influence the behavior of the fire in terms of direction, making it critical for firefighters to recognize and anticipate changes in wind patterns. Winds below 5 mph tend to be too gentle to have a notable impact on fire behavior. Calm winds, while also having minimal effect, do not contribute to the movement or intensity of fire in the same way that winds around 10 mph do. Winds above 15 mph may lead to more aggressive fire behavior and pose greater risks to firefighting efforts, but the specific question pertains to those around 10 mph, which present a crucial threshold where winds begin to actively affect the dynamics of fire spread.

6. What happens to surface winds during unstable atmospheric conditions?

A. They tend to be steady and mild

B. They can become gusty and turbulent

C. They remain unaffected by thermal conditions

D. They generally strengthen

During unstable atmospheric conditions, surface winds can become gusty and turbulent due to the increased vertical mixing of air. This occurs as warmer air rises and cooler air sinks, creating a dynamic atmosphere. The instability promotes the rapid movement of air, which disrupts the steady flow typically seen in stable conditions. Consequently, gusty winds can develop, resulting in unpredictable changes in wind speed and direction. This turbulent behavior is significant for wildland fire behavior, as it can influence the rate of spread and intensity of a fire. Understanding how unstable atmospheres affect wind patterns is crucial for firefighters when assessing fire risks and planning their strategies on the ground.

7. What are pockets of a fire?

A. Areas where flames are intensely concentrated

B. Long narrow extensions of the main fire

C. Unburned indentations formed by fingers or slow burning areas

D. Fire ignited outside the main perimeter

Pockets of fire refer to unburned indentations or areas within a fire perimeter that are often formed by the irregular shape of the fire's edge. These pockets may occur as a result of varying fuel types, topographical features, or slow-burning conditions. Understanding these features is crucial for fire suppression tactics as they can hold potential spots for reignition or flare-ups, presenting challenges to firefighting efforts. Recognizing pockets of fire helps firefighters anticipate where fire behavior might change and adjust their strategies accordingly to ensure safety and effective control of the blaze.

8. What primarily influences fire spread on slopes?

A. Moisture content of the air

B. The degree of incline of the hillside

C. The type of vegetation present

D. The ambient temperature

The degree of incline of the hillside is the primary factor influencing fire spread on slopes due to the physics of fire behavior. As a fire burns uphill, the flames reach the unburned fuel ahead more quickly because of the natural convection currents created by the heat rising. This results in the fire spreading faster on steeper slopes compared to gentler inclines. When a slope increases, the heat from the flames rises rapidly, preheating the fuels above and causing them to ignite sooner. Effective fire spread can be significantly affected by how steep the slope is; therefore, understanding the topography is crucial for predicting fire behavior and making firefighting decisions. While moisture content, type of vegetation, and ambient temperature are all important in influencing fire behavior and its intensity, none have the direct and immediate impact on fire spread as the degree of incline does. Each of these other factors contributes to the overall fire environment but does not influence the mechanics of how quickly a fire will move upslope.

9. How is creeping fire defined?

A. Fire that advances quickly with a well-defined head

B. Fire burning with a low flame and spreading slowly

C. Spinning vortex column of hot air and gases

D. Any sudden acceleration in the rate of spread

Creeping fire is characterized as fire that burns with a low flame and spreads slowly. This definition highlights the steady and gradual nature of creeping fire, distinguishing it from more aggressive fire behavior. Typically, this type of fire may occur in areas with abundant moisture or in fuel types that do not easily ignite or sustain rapid combustion. Creeping fire is significant in wildland fire behavior studies because it can often lead to prolonged fire suppression efforts and requires different strategies for control compared to faster-moving fires. Understanding the characteristics of creeping fire helps firefighters and incident commanders assess risks effectively and determine the appropriate tactics to employ in wildfire management.

10. What does low relative humidity generally indicate regarding fuel?

A. Higher moisture content in fine fuels

B. Increased fire spread potential

C. Lower chances of ignition

D. More dense vegetation cover

Low relative humidity generally indicates that the air is drier, which leads to reduced moisture content in the surrounding environment, including fuels such as grasses, shrubs, and trees. As the relative humidity decreases, the moisture in fine fuels evaporates more quickly. When fine fuels (like grass or small twigs) have lower moisture content, they ignite more easily and burn more readily, leading to an increased potential for fire spread. Dry conditions promote faster and more intense fire behavior, as the flames can move through the dry fuels more effectively. This relationship between relative humidity and fire behavior is critical for fire management and prevention efforts, as it helps predict how quickly a fire can spread under certain weather conditions. Understanding this concept is essential for firefighters and land management professionals when assessing fire risk and responding to wildland fire incidents.