

Chapter 4 Quiz

Name: _____ Date: _____

Directions: Write the correct letter on the blank before each question.

- _____ 1. Which element is included in the fire tetrahedron that is not part of the fire triangle model? (120)
- A. Fuel
 - B. Heat
 - C. Oxygen
 - D. Chemical chain reaction
- _____ 2. In order to burn, fuel must be in a _____ state. (120)
- A. solid
 - B. liquid
 - C. plasma
 - D. gaseous
- _____ 3. Which statement about smoke is accurate? (124)
- A. Smoke has the potential to burn.
 - B. Smoke has a relatively low vapor pressure.
 - C. Smoke is a product of complete combustion.
 - D. Smoke contains a higher concentration of oxygen than air does.
- _____ 4. Which is a measure of heat energy transfer rate? (127)
- A. Heat flux
 - B. Buoyancy
 - C. Temperature
 - D. Kinetic energy
- _____ 5. Heat transfers from one body to another by three mechanisms: conduction, radiation, and: (131)
- A. volatility.
 - B. buoyancy.
 - C. convection.
 - D. thermodynamics.

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- _____ 6. A fuel's _____ is the total amount of thermal energy released when a specific amount of that fuel burns. (136)
- A. kinetic content
 - B. chemical content
 - C. force of reduction
 - D. heat of combustion
- _____ 7. Which type of fuel is difficult to extinguish using water as the only extinguishing agent? (139)
- A. Polar solvents
 - B. Miscible liquids
 - C. Liquids that are less dense (lighter) than water
 - D. Liquids that are more dense (heavier) than water
- _____ 8. What is the primary consideration affecting how easily solid fuels ignite? (140)
- A. Specific gravity
 - B. Heat release rate
 - C. Total mass of the fuel
 - D. Surface-to-mass ratio
- _____ 9. What is the primary oxidizing agent in most fires? (140)
- A. Oxygen in the air
 - B. Carbon dioxide in the air
 - C. Hydrogen released during pyrolysis
 - D. Free radicals released during pyrolysis
- _____ 10. The range of concentrations of fuel vapor and air within which combustion can occur is the: (143)
- A. lean-burning range.
 - B. self-sustaining range.
 - C. flammable (explosive) range.
 - D. oxidation (combustion) range.
- _____ 11. Which is an example of a self-sustaining chemical reaction? (144)
- A. Convective flow
 - B. Flaming combustion
 - C. Chemical asphyxiation
 - D. Nonflaming combustion

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- _____ 12. The four stages of fire development are: (146)
- A. incipient, growth, pyrolysis, and decay.
 - B. incipient, growth, fully developed, and decay.
 - C. ignition, incipient, fully developed, and decay.
 - D. ignition, ventilating, fully developed, and decay.
- _____ 13. Which stage of fire occurs when all combustible materials in the compartment are burning at their peak heat release rate based on the available oxygen? (146)
- A. Decay
 - B. Growth
 - C. Incipient
 - D. Fully developed
- _____ 14. Development of a fire in the incipient stage depends largely upon the: (146)
- A. rate of the descent of the neutral plane.
 - B. characteristics of the compartment's ventilation.
 - C. characteristics and configuration of the fuel involved.
 - D. temperature differential between the fuel and the surrounding air.
- _____ 15. If there are no openings for lateral movement during the growth stage of a fire, the hot gases released during combustion will fill the compartment: (150)
- A. in swirling radiant currents.
 - B. starting at the ceiling and filling down.
 - C. uniformly as the room pressure equalizes.
 - D. upward and downward from the neutral plane.
- _____ 16. Most residential fires that develop beyond the incipient stage become: (151)
- A. fuel-limited.
 - B. too lean to burn.
 - C. ventilation-limited.
 - D. spontaneously ignited.

- _____ 17. When a compartment fire is in ventilation-limited decay, _____ can trigger flashover quickly. (152)
- A. introduction of new fuel
 - B. introduction of new oxygen
 - C. lowering of the neutral plane
 - D. rapid increase in temperature
- _____ 18. Which statement about flow paths and ventilation in a structure is accurate? (162)
- A. Once flow paths are established in a structure it is difficult to alter or interrupt the flow of gases and ambient air.
 - B. When hot gases follow the flow path from areas of high to low pressure, they carry heat away and cool the structure.
 - C. The flow is always unidirectional due to pressure differences where the heated fire gases move toward the seat of the fire.
 - D. When firefighters make entry into a building, they establish new flow paths between the fire compartment and exterior vents of the building.
- _____ 19. The total quantity of combustible contents of a building, space or fire area is referred to as the: (167)
- A. live load.
 - B. fuel load.
 - C. flammable load.
 - D. combustible load.
- _____ 20. Slower fire development in large compartments is due to the _____ and the increased distance that radiated heat must travel from the fire to the contents that must be heated. (173)
- A. high fuel loads
 - B. greater volume of air
 - C. type of building construction
 - D. oxygen deficient atmosphere