

CIS-481: Introduction to Information Security

InfoSec Chapter Exercise #9

Team: Seven

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Logistics

- A. Get together with other students on your assigned team in person and virtually.
- B. Discuss and complete this assignment in a collaborative manner. Don't just assign different problems to each teammate as that defeats the purpose of team-based learning.
- C. Choose a scribe to prepare a final document to submit via Blackboard for grading, changing the file name provided to denote the number of your assigned **Team**.

Problem 1

Name and describe the four categories of locks based on triggering process (discussed in your text on pp. 508-509). In what situations is each type of lock preferred? (8 points)

- **Manual Locks:** Padlocks and combination locks are commonplace and well understood. They are simple in operation and construction. These locks are made by manufacturers so they are unalterable. These locks can only be changed by a locksmith. They are used when securing a single door.
- **Programmable Locks:** These are more sophisticated than manual locks. They can be modified after they are put in service. Their combinations are keys can be changed without a locksmith. They also allow the owner to switch to another access method to upgrade security. They are used when securing computer rooms or wiring closets.
- **Electronic Locks:** These can be combined with alarm systems and other building management systems. These devices operate by means of electric current. Electronic locks can also be combined with sensors to create various combinations of locking behavior. They are used to secure computer rooms or communication rooms.
- **Biometric Locks:** These are the most sophisticated locks. They include fingerprinting, palm and hand readers, retina and iris scans, and voice patterns and signature readers. They are used in high security situations in highly secured areas.

Problem 2

Your text describes three elements that must be present for a fire to ignite and continue to burn. Newer research suggests a fourth element is required, too. See:

<https://www.firesafe.org.uk/information-about-the-fire-triangletetrahedron-and-combustion/>

Name and describe the four elements of the "fire tetrahedron". How do fire suppression systems manipulate the four elements to quell fires? (9 points)

- The four elements of the fire tetrahedron are oxygen which sustains combustion, heat raises the material to the ignition temperature, fuel or combustible materials, and an exothermic chemical chain reaction in the material.
- Fire extinguishers put out fire by taking away one or more elements of the tetrahedron. Fire suppression systems alter an environment to quell fires by limiting any of all the four elements. They remove oxygen, cut the fuel off, reduce temperature by cooling, or reduce

the number of excited molecules which breaks the chain reaction. Carbon-dioxide and soda acid systems remove the oxygen needed to keep the fire going.

Problem 3

Name and describe the five classes of fire described in the text. How does the class of a fire dictate how to control the fire? (8 points)

- **Class A Fires:** Involve explosive fuels such as wood, paper, textiles, rubber, cloth, and trash. They are extinguished by agents that interrupt the ability of the fuel to be ignited. Water and Multipurpose dry chemical fire extinguishers are ideal for these types of fires.
- **Class B Fires:** Fueled by explosive liquids or gasses such as solvents, gasoline, paint, lacquer, and oil. CO₂ and Halon extinguishers remove oxygen from the fire.
- **Class C Fires:** Energized electrical equipment or appliances. CO₂ and Halon extinguishers remove oxygen from the fire. They are extinguished with non-conducting agents only. Water extinguishers are not preferred for a Class C.
- **Class D Fires:** Fueled by combustible metals like magnesium, lithium, and sodium. They require special extinguishing agents and techniques.
- **Class K Fires:** Fueled by combustible cooking oil and fats in commercial kitchens. These fires are classified as Class F in Europe and Australian environments. These fires require special water mist, dry powder, or carbon dioxide agents to extinguish.
- The class of fire does guide us how to control the fire. Identifying the material that started the fire and the fuel source will dictate how to properly and safely extinguish it.