

一、選擇題 (30%) ※ 本大題請作答於試卷內「選擇題作答區」。

1. IDLH means: A) Identification, Detection, & Limitations B) Immediately Dangerous to Life or Health C) Identification, Detection, & Limitations D) Industrial Department, Labor and Health
2. Which of the following is not a common control method for particulate pollutants? A) Settling chamber B) Scrubber C) Filter D) Cyclone
3. What is the duct velocity in a 6 inch duct with an airflow of 1000 cubic ft/min ? A) 5000 ft/min B) 5092 ft/min C) 6750 ft/min D) 7225 ft/min
4. When placing particulate control devices in series, which of the following would be the best choice? A) Precipitator, then a cyclone separator B) HEPA filter, then a chip trap C) Baghouse, then a settling chamber D) Cyclone, then a baghouse
5. At a point upstream from the fan in an exhaust system, the absolute values of velocity pressure and static pressure are 2.0 and 3.5 inches of water, respectively. What is the total pressure at this point? A) +1.5 inches of water B) -1.5 inches of water C) +5.5 inches of water D) -5.5 inches of water
6. Dilution ventilation is: A) Used to control a contaminant at its source B) Used for controlling vapors having low toxicity C) More economical than local exhaust ventilation D) Is the first consideration for hazard control
7. Velocity pressure of a system is always: A) Equal to static pressure B) Equal to total pressure C) Negative D) Positive
8. The hierarchy of controls for exposure to air contaminants is: A) Environmental controls, source controls, PPE B) PPE, source controls, environmental controls C) Source controls, environmental controls, PPE D) Source controls, personnel controls, PPE
9. Static pressure on the exhaust side of a fan is normally: A) Negative B) Positive C) Neither negative or positive D) Greater than 100 MPascals
10. The collection efficiency of a particulate filter is 40%. What is the overall efficiency when using 2 of these filters in series? A) 80% B) 72% C) 64% D) 40%

二、簡答題 (70%)

11. What are the primary methods of gaseous contaminates removal? (10%)
12. What are the main mechanisms of aerosol filtration? (10%)
13. Please name at least 5 conditions under which 'dilution ventilation', rather than a 'local exhaust ventilation system', should be used to control the occupational environment. (15%)
14. What are the major components of an effective respiratory protection program? (15%)
15. Perchloroethylene (PCE) was being used to clean metal components in a local factory. However, the employees' exposures to PCE were close to the Threshold Limit Values (TLVs). Please describe (1) how you would investigate this situation and (2) what the potential solutions could be to lower the exposures. (20%)