※注意：第I部份請依題號順序於答案卷之「選擇題作答區」內依序作答。

Note: write down all your answers on the answer sheets, NOT on the question sheets.

I. Please choose **one** most appropriate answer for each question (3 points each):

1. The _____ includes the living organisms together with the chemical and physical constituents of the environment. (A) ecosystem (B) community (C) habitat (D) all of the above.
2. Which of the following is the first line of defense against the causative agents in human environment? (A) public health and prevention medicine (B) environmental health practices (C) adaptive response of the human body (D) curative medicine
3. Which of the following is an essential characteristic of living systems in human environment? (A) chemical signaling (B) differentiation (C) metabolism (D) evolution (E) all of the above.
4. Which of the following cases has the highest priority in environmental sampling? (A) high health effect ranking and low exposure ranking (B) high health effect ranking and high exposure ranking (C) low health effect ranking and high exposure ranking (D) medium health effect ranking and high exposure ranking (E) it doesn't matter.
5. An environmental microbe that requires oxygen, but finds higher concentrations of oxygen toxic, is called a/an (A) aerotolerant anaerobe (B) obligate aerobe (C) facultative aerobe (D) obligate anaerobe (E) microaerophile.
6. For your personal health reason, you are requested by the employer to work at a new department. In this case, which principle is applied for hazard control in workplaces? (A) substitution (B) administration (C) personal protection equipment, (D) engineering control.
7. In principle, which of the following is the last defense in prevention of exposure

接背面

to airborne biohazards from workplaces? (A) management of air quality (B) use of personal protection equipment (C) use of safety equipments (D) none of the above.

8. The _____ of an ecosystem reduces the diversity of organisms and weakens the food web. (A) photosynthesis; (B) mineralization; (C) combustion; (D) retrogression; (E) evaporation.
9. _____ are able to synthesize their own food substances. (A) Fungi; (B) Autotrophs; (C) Heterotrophs; (D) Saprophytes; (E) Mammals
10. When the process of _____ is prolonged and severe, it can be life threatening such as in asthmatic attacks. (A) coughing; (B) sneezing; (C) bronchoconstriction; (D) mucociliary streaming; (E) nasal congestion.
11. _____ is the main organ responsible for detoxification. (A) Kidney; (B) Lung; (C) Stomach; (D) Gill; (E) Liver.
12. _____ caused Yu-cheng Disease in Taiwan. (A) Asbestos; (B) Thalidomide; (C) PCBs; (D) Mercury; (E) Arsenic.
13. _____ is the major reason for TB to be resistant to medication. (A) Patients who consume garlic with their medication; (B) Patients who do not finish all of the medicine; (C) Patients who are iron-deficiency in nutrition; (D) Patients who get TB organisms that originate from desert regions; (E) Patients who are elder.
14. _____ is NOT a main step of water treatment. (A) Distillation; (B) Filtration; (C) Disinfection; (D) Coagulation-flocculation; (E) Sedimentation.
15. Biological contaminants indoors are most likely aggravated by _____. (A) auto exhaust; (B) household chemicals; (C) unvented gas stove; (D) moisture; (E) nonionized radiation.
16. _____ could be one of the most effective ways to dispose hazardous wastes.

接次頁

(A) Deep-well injection; (B) Sanitary landfill; (C) Surface impoundments; (D) Composting; (E) Incineration.

17. From a public health perspective, risk is better to be described as_____.
(A) likelihood of an unwanted outcome when it will occur; (B) when an undesirable endpoint will be reached; (C) a mechanism of a bad outcome is well understood; (D) cost to prevent a bad outcome from happening; (E) the economic loss of an unwanted outcome.

II. Please answer the following questions **briefly**:

1. Xenobiotics are defined as _____。(4 points)
2. Select and fill in three xenobiotics _____ from the following (A) – (H). (A) mercury (B) pesticides (C) E. coli (D) PCBs (E) dyes (F) chlorinated solvents (G) lead (H) arsenic (6 points)
3. Reaction with hydroxyl radicals is a primary degradation pathway of PCBs in the air. Please list two features of molecular structures within the homologue and two environmental factors, respectively that will facilitate the degradation and explain the reasons shortly. (8 points)
4. For a phenolic chemical, please compare its relative solubility and volatility in river water with that in sea water, and explain why. (6 points)
5. What are the five air pollutants that the EPA uses to calculate the Pollutant Standards Index (PSI)? Under which level of PSI the air quality is deemed as good or moderate? (10 points)
6. What is 'photochemical smog'? What are the major components to form photochemical smog? Which subpopulations are more susceptible to photochemical smog? (15 points)