＊注意：請於答案卷上作答；本份試卷共四大部份，合計題數：49 題＊
以下選擇題第 1~39 題請作答於試卷內「選擇題作答區」。

I. 單選題: 每題僅可選擇一個答案，選取兩個或以上者不給分。(每題 1.5 分，10 題，共 15%):

1. Shellfish toxins are produced by: (A) clams; (B) oysters; (C) fungi; (D) algae; (E) bacteria.
2. The major exposure route of mycotoxins is: (A) inhalation; (B) ingestion; (C) drinking; (D) dermal absorption; (E) infection.
3. Which disease has been eradicated from Taiwan? (A) typhoid; (B) dysentery; (C) Japanese encephalitis; (D) malaria; (E) dengue fever.
4. The concentration of ppm represents: (A) g/kg; (B) mg/kg; (C) g/kg; (D) ng/kg; (E) pg/kg.
5. The etiology of bovine spongiform encephalopathy would be: (A) virus; (B) prion; (C) endotoxins; (D) copper; (E) nitrosamines.
6. Regarding groundwater remediation, which solvent is classified as "dense nonaqueous phase liquid"? (A) acetone; (B) methanol; (C) toluene; (D) dichloroethylene; (E) acetonitrile.
7. Levels of AST and ALT in serum are the function indices of (A) spleen; (B) kidney; (C) liver; (D) lung; (E) stomach.
8. The ozone layer, which can block the radiation from the Sun, primarily locates in (A) stratosphere ; (B) troposphere; (C) exosphere ; (D) mesosphere; (E) thermosphere.
9. Most countries deem the acid rain as below the pH: (A) 2.5; (B) 3.0; (C) 4.0; (D) 5.0; (E) 6.0.
10. Lives of aqueous creatures would be threatened if the dissolved oxygen in water at 20℃ is lower than: (A) 5 ppm; (B) 6.5 ppm; (C) 8 ppm; (D) 10 ppm; (E) 12 ppm.

II. 複選題: 每題有兩個正確答案，全對始給分。(每題 2.5 分，14 題，共 35%):

11. Please choose the correct relationship between exposed chemicals with possible adverse health effects: (A) inorganic mercury vs Minamata disease; (B) benzene vs leukemia; (C) polychlorinated dioxins vs chloracne; (D) lead vs black foot disease; (E) aflatoxin B1 vs kidney cancer.
12. Please choose the correct link between the convention and the problem that it wants to deal with: (A) Stockholm Convention on persistent organic pollutants; (B) Basel Convention on transboundary movements of hazardous wastes; (C) Montreal Protocol on dumping wastes into oceans; (D) Kyoto Protocol on ozone-layer depletion; (E) London Convention on green-house gases.
13. Which are the two most primary categories in recyclable municipal solid wastes in Taiwan in recent years (weight basis)? (A) glass; (B) metals; (C) rubber and leather; (D) paper; (E) plastics.
14. Which are the secondary air pollutants? (A) SO_x; (B) NO_x; (C) ozone; (D) hydrocarbons; (E) peroxyacetyl nitrate.
15. Which are NOT in the suggested regulated items of indoor air quality by Taiwan EPA? (A) formaldehyde; (B) total PAHs; (C) fungi; (D) moisture; (E) CO_2.
16. Which are NOT waterborne diseases? (A) hepatitis A; (B) cholera; (C) pneumonia; (D) plague; (E) giardiasis.

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17. Which are the primary disinfection byproducts after chlorination? (A) chlorobenzene; (B) acrylamide; (C) vinyl chloride; (D) trihalomethanes; (E) haloacetic acids.
18. Which ones are measures to improve food safety? (A) waste to energy; (B) toxicity characteristic leaching procedure; (C) hazard analysis critical control points; (D) tradable permits; (E) good hygienic practice.
19. Which two most preferred procedures to manage hazardous wastes? (A) thermal treatment; (B) waste reduction; (C) chemical stabilization; (D) reuse/recycling of materials; (E) landfills.
20. Regarding composting, which statements are correct: (A) it prefers in anaerobic condition; (B) use of the temperature of 60-80℃ for reducing the treatment time; (C) rubber and plastics have to be excluded; (D) adjustment of carbon/phosphorus ratio to facilitate the growth of microorganisms; (E) the preferred moisture content is usually 45-55%.
21. Which two chemicals are less irritative to upper respiratory tracts among the five ones? (A) NO_2; (B) ammonia; (C) SO_2; (D) chlorine; (E) phosgene.
22. Which two chemicals are mainly neurotoxic? (A) chloroform; (B) hexane; (C) diethylstilbestrol; (D) cadmium; (E) parathion.
23. Which chemicals need bioactivation for their toxicity? (A) malathion; (B) trichloroethylene; (C) botulinum toxin; (D) asbestos; (E) PCBs.
24. Which compounds are NOT primary green-house gases? (A) N_2O; (B) water vapor; (C) carbon dioxide; (D) perfluorochemicals; (E) methane.

III. 單選題：每題僅可選擇一個答案，選取兩個或以上者不給分。(每題 2 分，共 30%):

25. Why wouldn't a nylon cyclone be placed in front of a filter when sampling for ZnO? (A) You could damage the cyclone from corrosive gases (B) When sampling either welding or other freshly generated fume exposures, where all particles could be assumed to be respirable (C) The cyclone would restrict the flow and reduce the pressure at filter (D) The cyclone would bias the sample flow

26. A monitoring device brings in a high speed air stream containing dust. The air stream is directed through a series of plates with holes in them. This is an example of a(n): (A) Cascade impactor (B) Impinger (C) Vertical elutriator (D) Horizontal elutriator

27. In the scrubbing of biosafety cabinet effluent, what is the most universal scrubbing technology utilized? (A) Entry of effluent into chemical scrubber (B) HEPA filtration (C) Incineration (D) Chemical sanitation

28. A carbon dioxide concentration of 1800 ppm is measured in an occupied office space. This causes concern because: (A) The concentration exceeds the 8-hour TWA PEL for carbon dioxide (B) The concentration exceeds the Short-Term Exposure Limit PEL for carbon dioxide (C) Concentrations in this range, while well below the PEL, indicate a shortage of fresh outside air being supplied to the work area (D) The concentrtation, while less than the PEL, exceeds the ACGIH TLV

29. All of the following are effective measures to minimize the effects of shiftwork EXCEPT: (A) Rotating shifts clockwise (B) Limiting the night shift to no more than 8 hours (C) Sleeping in a dark, quiet, comfortable place (D) Taking sleeping pills for the first year of shift work

30. Disorders that are caused, precipitated, or aggravated by repeated exertions or movements of the body are LEAST likely identified with the term: (A) Repetitive strain injuries (B) Cumulative trauma disorders (C) Occupational cervicobrachial disorders (D) Ergonomics

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31. During a heat stress evaluation, you measure an air temperature of 32°C, a mean radiant temperature of 54°C, and an air velocity of 300 ft/min. Under these circumstances, which of the following statements is true? (A) The worker is gaining heat from convection and losing heat from radiation (B) The worker is losing heat from convection and gaining heat from radiation (C) The worker is gaining heat from both convection and from radiation (D) The worker is losing heat from both convection and from radiation

32. In heat stress science and calculation of heat stress on the body, metabolism is always: (A) Negative (B) Positive (C) Can be both positive and negative (D) Always negative; can never be positive

33. A means of avoiding problems associated with leaks into the face mask is to: (A) Specify full-face masks only (B) Exclude air purifying respirators (C) Utilize positive pressure respirators (D) Fit test properly

34. Which of the following is the definition of an inhalable particle? (A) A particle which is deposited anywhere in the human respiratory tract (B) A particle which is deposited anywhere within the lung airways and the gas-exchange region of the human respiratory tract (C) A particle which is deposited within the nose and mouth of the human respiratory tract (D) A particle which is deposited in the gas-exchange region of the human respiratory tract

35. BEI's are limits recommended by the ACGIH. They are direct measures of _____ rather than indirect measurements such as those relating to air concentrations. (A) Exposure (B) Body burden (C) LD50 (D) PEL

36. Of the following, which is false? (A) A "skin" notation means the chemical causes dermatitis (B) A mixture calculation may be used when toxic effects are similar (C) The term TWA implies the exposure limit may be exceeded for short periods (D) A ceiling notation means the level may not be exceeded at any time

37. Compared to local exhaust ventilation, dilution ventilation: (A) Is more suitable for highly toxic substances (B) Is very good for ventilating point source emissions (C) Is less effected by short circuiting of exhaust (D) Uses less air than local exhaust ventilation

38. A HAZMAT team is: (A) A typical fire brigade (B) An organized group of employees who are expected to handle and control leaks or spills of hazardous substances (C) An emergency medical surveillance team (D) A first aid team

39. It is important to absorb or intercept laser wavelengths of even low energy beams in certain cases because: (A) lasers can easily reach unprotected skin (B) lasers can cause cancer at low doses (C) with lasers being used in a growing number of technologies, there are an increased number of non-technical users (D) some wavelengths can be concentrated by the body.

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IV 配合題：請自下列右方的選項中選擇最合適的答案；單選；選取兩個或以上者不給分。(每題 2 分，共 20%)

40. White noise	A) For a single radioactive decay process, the time required for the activity to decrease to half its value by that process.
	B) Average air velocity into the exhaust system measured at the opening into the hood or booth.
41. Half-value layer	C) Unit of absorbed radiation dose equal to one joule of absorbed energy per kilogram of matter.
	D) One disintegration per second; a measure of the rate of radioactive disintegration.
42. Capture velocity	E) The potential pressure exerted in all directions by a fluid at rest.
	F) Noise that has been weighted, especially at the low end of the spectrum, so that the energy per band (usually octave band) is approximately constant over the spectrum.
43. Sievert	G) American Industrial Hygiene Association
	H) National Institute for Occupational Safety and Health
44. Threshold Limit Values; TLVs	I) The thickness of a substance necessary to reduce the intensity of a beam of gamma or x rays to half its original value.
	J) Unit of absorbed radiation dose in Gray times the Quality Factor of the radiation in comparison to gamma-radiation.
45. Velocity pressure	K) American Conference of Governmental Industrial Hygienists
	L) The kinetic pressure in the direction of flow necessary to cause a fluid at rest to flow at a given velocity.
46. Absolute humidity	M) The ratio of the actual partial vapor pressure of the water vapor in a space to the saturation pressure of pure water at the same temperature.
	N) A noise whose spectrum density (or spectrum level) is substantially independent of frequency over a specified range.
47. Wind chill index	O) An arbitrary index that combines into a single value the effects of temperature, humidity, and air movement on the sensation of warmth and cold on the human body.
	P) A process of spontaneous intermixing of different substances attributable to molecular motion and tending to produce uniformity of concentration.
48. Brownian motion	Q) A device to measure air speed.
	R) The weight of water vapor per unit volume
49. Asbestos	S) The irregular movement of particles suspended in a fluid as a result of bombardment by atoms and molecules.
	T) Air velocity at any point in front of the hood necessary to overcome opposing air currents and to capture the contaminated air by causing it to flow into the exhaust hood.
	U) A disease of the lungs caused by inhalation of fine airborne fibers.
	V) A hydrated magnesium silicate in fibrous form.
	W) A temperature index used to account for heat loss from skin exposed to the combined effects of cold temperatures and air speed.

試題隨卷繳回