



UNIVERSITY OF SWAZILAND
Faculty of Health Science

Department of Environmental Health
Sciences

Final Examination 2007

- TITLE OF PAPER : OCCUPATIONAL AND ENVIRONMENTAL HEALTH
COURSE CODE : EHS 302
DURATION : 2 HOURS
MARKS : 100
INSTRUCTIONS : READ THE QUESTIONS & INSTRUCTIONS
CAREFULLY
: ANSWER ANY FOUR QUESTIONS
: EACH QUESTION CARRIES 25 MARKS
: NO PAPER SHOULD BE BROUGHT INTO NOR OUT
OF THE EXAMINATION ROOM
: BEGIN EACH QUESTION ON A SEPARATE SHEET
OF PAPER

DO NOT OPEN THE QUESTION PAPER UNTIL PERMISSION HAS BEEN
GRANTED BY THE INVIGILATOR.

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Question 1.

- a) Industrial Hygiene is that science and art devoted to **anticipation, recognition, evaluation and control** of those environmental factors or stresses arising from the workplace. Briefly discuss each of these principles in this field of study
(20marks)
- b) According to ILO and WHO, what are the aims of an occupational health service?
(3marks)
- c) Who is considered the “father” of occupational medicine? Briefly discuss his contributions to occupational medicine.
(2marks).

Question 2.

- a) Define the following acronyms used in occupational health and safety and briefly explain their significance in this field of study.
- IDLH (3marks)
 - REL (3marks)
 - PEL (3marks)
 - TLV (3marks)
 - TWA (3marks)
 - LD₅₀ (3marks)
 - LC₅₀ (3marks)
- b) The TLV for TDI has a large C next to the TLV, What is the purpose of the C notation?
(2marks)
- c) The TLV for a chemical has an S notation, what does the S mean?
(2marks)

Question 3.

A. There are precise meanings for certain words commonly used in industrial hygiene. These must be correctly used in order to understand the requirements of the Occupational Health legislation and to effectively communicate with other health professionals. Match each of the following terms with its correct definition.

- Dust
 - Fumes
 - Smoke
 - Aerosols
 - Mists
 - Gases
 - Vapours
- a) The gaseous form of substances that are normally in the solid or liquid state at room temperature and pressure.
 - b) Liquid droplets or solid particles dispersed in the air that are fine enough particle size to remain so dispersed for a period of time.
 - c) A state of matter in which the material has a low viscosity. Can expand and contract greatly in response to changes in temperature and pressure and readily and uniformly distributes itself throughout any container.
 - d) Suspended liquid droplets generated by condensation from the gaseous to the liquid state or by breaking up a liquid into dispersed state, such as splashing, foaming, or atomising.
 - e) Solid particles generated by handling, crushing, grinding, rapid impact, detonation, and decrepitation of organic or inorganic materials.
 - f) Airborne particulate formed by the condensation of solid particles from gaseous state usually generated after initial volatilisation from a combustion process, or from a melting process.
 - g) An air suspension of particles originating from combustion or sublimation: generally contains droplets as well as dry particles.

(14 marks)

B. Using the principles of industrial hygiene describe how you would perform an industrial hygiene evaluation in a small secondary lead smelter of ten workers.

(10 marks)

Briefly describe the following;

- i) Carpal tunnel syndrome
- ii) Coal workers pneumoconiosis

(2marks)

(4marks)

(Total = 25marks)

Question 4.

- A. What is meant by:
- i) Acoustic impedance. **(2 marks)**
 - ii) The decibel. **(2 marks)**
- B. What determines the following characteristics of sound?
- i) Pitch
 - ii) Loudness
 - iii) Quality (or timbre) **(6marks)**
- C. What is;
- i) Sound Power Level (SWL) **(3marks)**
 - ii) Sound Pressure Level (SPL) **(3marks)**
 - iii) Two sound sources are operating together. One source alone would produce 76dB and the other 70dB. Calculate from the first principle the overall SPL. **(6marks)**
 - iv) Name two (2) physiological and two (2) psychological effects of noise. **(3marks)**

Question 5.

- A. What is the difference between dry and wet deposition **(6 marks)**
 - B. What are the reactions that make the ozone layer and using CFC's as an example, give a detailed description of the reactions that break the ozone layer **(15 marks)**
 - C. Which gases are known as the main greenhouse gases **(4 marks)**
- (Total = 25marks)**