



UNIVERSITY OF SWAZILAND

Faculty of Health Sciences

Department of Environmental Health Science

May 2014 Main Examination

Title of paper: AIR SAMPLING AND ANALYSIS II

Course code: EHS 565

Time allowed: 2 HOURS

Marks allocation: 100 Marks

Instructions:

- 1) QUESTION 1 IS COMPULSORY**
- 2) Then answer ANY OTHER THREE (3) questions**
- 3) Each question is weighted 25 marks**
- 4) Write neatly and clearly**
- 5) Begin each question in a separate sheet of paper**
- 6) Numbering within a chosen question should be in a sequential order**

This paper is not to be opened until the invigilator has granted permission

QUESTION 1

You have been hired by a newly opened coal mine when suddenly there is an outburst of different gases. There are a couple of causalities due to this explosion. What detection method would you use to check the following type of gases and how will you treat the exposed workers?

- a)
- i. Nitric oxide (3)
 - ii. Hydrogen sulphide (3)
 - iii. Sulphur dioxide (4)
 - iv. Radon (4)
 - v. Carbon monoxide (4)
- b) What do you call a methane mixture in the air? (2)
- c) Define a confined space (2)
- d) List 3 exposure effects that the absorption of CO in the bloodstream is dependent on (3)

QUESTION 2

- a) Define oxygen-deficiency and outline what happens to a worker if the Oxygen level has fallen to the following categories: (12)
- i. 16%
 - ii. 17%
 - iii. 6%
 - iv. 10 -12 %
- b) The policy on RPE record-keeping has 3 key benefits if a workplace has it. Name these 3 components (6)
- c) Why is it considered a good practice to have an on-going review of an RPE program (4)
- d) Briefly write short notes on how source control can improve indoor air quality (3)

QUESTION 3

- a) You have been employed to oversee a respirator at the University and for a start you have to make a presentation to the staff on this matter. Outline the 7 key points that your presentation will cover (7)
- b) Schematically draw a cyclone dust collector and in a point form briefly indicate its operation (10)

- c) How is static electricity used in electrostatic precipitators? (2)
- d) During a walkthrough survey of the RPE storage, you discover that the equipment has been stored haphazardly. Outline the points that you will raise to the store-man about respirators storage (6)

QUESTION 4

- a) In a point form write how a Survair 2000 dual cartridge half-mask face-piece should be donned (6)
- b) Name 4 types of medical screening that a worker may be subjected to apart from the normal medical examinations workers are familiar with (4)
- c) Write a formula to calculate an EPF and disintegrate the formula (6)
- d) What is the essence of carrying out hazards investigation? (4)
- e) Outline the disadvantage of EPF? (3)
- f) Air filters produce different levels of noise. What is the highest noise level that can be produced by a quieter unit of an air filter? (2)

QUESTION 5

- a) Briefly describe a HEPA air filter and indicate both its merits and demerits (6)
- b) Health Surveillance has to ensure that the method is practical and ethical to workers, what do you understand by these 2 words? (4)
- c) What action would you take if a worker has been declared unfit during a standard medical surveillance program, Part 3 (Medical Adjudication) (6)
- d) If the above worker has to apply for disability and assuming the application is successful name 2 types of awards that the worker may be granted (4)
- e) A QLFT is grouped into 3 types of responses. Name these responses (3)
- f) Why is Health Surveillance considered an important exercise before donning an RPE? (2)