



PROGRAM : NATIONAL DIPLOMA
ENVIRONMENTAL HEALTH
SUBJECT : OCCUPATIONAL HEALTH AND SAFETY III
CODE : OHS 32-1
DATE : DECEMBER EXAM (PRACTICAL)
NOVEMBER 2016
DURATION : 2 Hours (120 MINUTES)
WEIGHT: 50: 50
TOTAL MARKS: 90

EXAMINER : MR MASEKAMENI MASILU DANIEL

MODERATOR: MR KHOZA N 4075

NUMBER OF PAGES: 3 PAGES

INSTRUCTIONS TO STUDENTS:

1. Answers all the questions, answer all questions in the appropriate format and number accordingly.
 2. Read your questions carefully. You will be penalised if your answers are not properly structured.
 3. You can start with any question, but do not divide sub-questions of the same question.
 4. Please write neatly.
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QUESTION 1 [25]

Currently dust exposures especially in the mining sector, continue to receive massive attention as the industrial revolution, aim to comply with various statutory requirements and reach full potentials of milestone sets to minimize exposures.

1. Develop a sampling strategy for silica dust in a confined area. Divide your strategy in to two evaluation methods. In your presentation, indicate the purpose, equipment you will use for the two problematic dust fractions (inhalable and respirable dust), internal calibration procedure and legislation you will refer in making final decision. [25]

QUESTION 2 [43]

Company LMNJ employed you as the Occupational Hygienist, upon your day-to-day duties you decide to carry out an evaluation for inhalable dust. The evaluation results raw data before processing are as follows:

The post mass of the cassette and the filter was 0.01968 grams for control, while the mass of the cassette and the filter after sampling for field filter was 0.02417 grams. The mass of the cassette for both control and field filter were 0.019 grams, while the mass of the cassette and filter were 0.01932 grams, before sampling. The sample was taken from 08h00am to 15h00pm. The pump flowrate was set at 1.98 L/minutes, 1.89 L/minutes on a second spot check, while after sampling the pump flowrate was found to be at 2.01 L/minutes.

- 2.1. Calculate the final concentration of dust in the room, please show all steps taken until the final answer is obtained. E.g. how you have worked on your final corrected mass and flowrate. [15]

- 2.2. Calculate flowrate % error, for the three pump flowrate readings [6]

- 2.3. Calculate the worker's exposure and compare with the OEL [2]

2.4. From the sample above half of the dust was found to be equivalent to 0.00049 grams of silica dust. From the total silica content quartz was found to be 0.00028 grams, Tridymite was found to be 0.07 milligrams while the remaining mass was found to be Cristobalite.

- 2.4.1. Calculate the mass of each category of silica [3]

- 2.4.2. Calculate the percentage of silica [2]
- 2.4.3. Calculate the percentage of each silica category [6]
- 2.4.4. Calculate OEL of each silica category [9]

Question 3 [17 Marks]

Purchasing PPE for the organization requires careful identification and evaluation of the personal protection aid. Company LMNJ selling face-shields equipped with respiratory aids approaches you.

- 3.1. Explain different ways you will use in evaluating PPE efficiency [5]
- 3.2. Given that the concentration in the room of contaminant A was 10 mg/m^3 and the concentration of contaminant A behind the face-shield was 0.2 mg/m^3 .
 - 3.2.1. What will be the NPF? [4]
 - 3.2.2. What will be the EPF if the worker had the face-shield over 8 hours? [2]
 - 3.2.3. What if the face-piece was used for 8 hours but in the 8 hours, 4 hours the shield was not fitted correctly. [4]
 - 3.2.4. What will be the EPF should the worker decide not to use the face-shield?[2]

Total= 90 marks