UNIVERSITY OF JOHANNESBURG

FINAL EXAMINATION

PROGRAM	:	NATIONAL DIPLOMA ENVIRONMENTAL HEALTH
SUBJECT	:	**ENVIRONMENTAL POLLUTION III** **AIR AND NOISE**
CODE	:	**ENP 32-1**
DATE	:	**FINAL EXAMINATION** 19 NOVEMBER 2016
DURATION	:	3 (THREE) HOURS
WEIGHT	:	50: 50
TOTAL MARKS	:	150
EXAMINER	:	MR MASEKAMENI MASILU DANIEL
MODERATOR	:	MR. TSHIPAL N.L. 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. Use of a calculator will assist you in answering some of the questions

4. You can start with any question, but do not divide sub-questions of the same question.

5. Please write neatly.

QUESTION 1 (33 MARKS)

1. Globally, air pollution is responsible for over 7 million pre-mature deaths; most of these mortalities are experienced in developing countries. Please agree or disagree with this statement in answering the following:

1.1. Obviously, pollution is caused by various sources. Please with practical examples explain the concept of anthropogenic sources and indicate how they contribute to ambient and indoor air pollution [20]

1.2. It happen that, you are employed by SAPPI and one of your responsibilities is to guide the company to reduce their industrial emissions. SAPPI plan to build a hybrid furnace, which will use Biomass/ wood or combination to supplement their energy needs. Please explain factors, which will improve the combustion efficiency once the furnace is completed. Remember the furnace is not yet built. [14]

1.3. Adequate supply of air during the combustion process is essential during combustion process. Unfortunately, combustion conditions varies, which require increase or decrease of air supply. Please explain how you will use excess air to monitor the combustion process in the furnace. At which stage will you increase or decrease excess air. [9]

QUESTION 2 (32 MARKS)

Approach to air quality and climate change management, with South Africa being part of the global community, there are current agreements and standards introduced to effectively, reduce the burden of air pollution. In recent years, adding to the agreement is the development of the Air Quality Act, 2004 (Act 39 of 2004)

2.1. Since 2007, the national framework have been announced to deal with ambient air quality management in South Africa including efforts to contribute to the global reduction of air pollutant. Please indicate the main headlines as entailed in the National Air Quality Framework of 2007, promulgated to enforce or to achieve the objectives of NEM: AQA, 2004 (Act 39 of 2004). [20]

2.2. In recent global discussions, the need to address climate change occupy a larger portion in the agenda items. You are in the present of the Minister of Environmental Affairs Cllr Edna Molewa and through her committee you are requested to provide clarity on the Albedo effect and how it contributes to climate change [12]

QUESTION 3 (30 MARKS)

Energy efficiency is a common terminology recently, however without clear understanding of the underlying concepts it will be non-imperative to spend time preaching about it. The concept of energy efficiency is based on the concept of energy saving and money rebates.

3.1. Please, explain how energy efficient building fit in the concept of energy efficiency. Either please indicate which energy saving opting you are referring to and how a building structure, can positively or negatively contribute. [9]

3. About 350 RDP houses are built by government in Soweto; you are requested by the Department of Environmental Affairs to carryout emission risk based profile. You are told that, the entire 350 household will use electricity from Kusile Power Plant in Mpumalanga. The station/ plant is coal fired with the following emission data sets:

CO emission factor	**CO_2 emission factor**	**PM emission factor**
4.1 g/MJ	102 g/MJ	3.3 g/MJ

3.1. If one household require 6100 W of energy per day, how much kW will the entire settlement require to operate their activities in a day/ month and year. [6]

3.2. How much will be the total gaseous and particulate emissions contributed by the settlement during day-to-day operation at Kusile. Please assume maximum utilization in all 350 households. [15]

QUESTION 4: Meteorology (25 MARKS)

You are invited by the Executive Director on behalf of the Department of Environmental Affairs to give a public talk to his staff and other stakeholders. **In your presentation you are requested to cover the following:**

4.1. Explain lapse rates in atmospheric stability [10]

4.2. Explain plume behavior, please relate situations where conditions are less favorable and suitable for dispersion [15]

QUESTION 5: Noise Management (30 MARKS)

5.1. Community A, member Mr. Smith in Johannesburg lodged a noise complaint to your office regarding a music concert held at Johannesburg Stadium. Please explain how you will go about investigating this complaint [15]

5.2. Explain the concept of environmental impact assessment in major projects in South Africa. Please end by explaining the steps involved during EIA. [15]

TOTAL: 150