

**W1-2-60-1-6**

## JOMO KENYATTA UNIVERSITY OF AGRICULTURE AND TECHNOLOGY

# University Examinations 2016/2017

**YEAR 2 SEMESTER II EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN ENVIRONMENTAL SCIENCE**

**SZL 2214: HAZARD IDENTIFICATION AND RISK MANAGEMENT**

**DATE: June 2017 TIME: 2 HOURS**

**Instructions: Answer Question One (Compulsory) and Any Other Two Questions.**

**QUESTION ONE (30 MARKS)**

1. i. Define a hazard. (1mark)

ii. Identify four types of hazards and places where hazards are found. (4marks)

1. State and describe the three basis of hazards recognition. (6marks)
2. i. Define hazard exposure (1mark)

ii. Describe three forms of exposure (focus) and give examples. (3marks)

1. Differentiate between the following:
2. Risk analysis and risk evaluation (1mark)
3. Performance and Reliability of a system. (1mark)
4. Risk and event consequences (1mark)
5. Relative risk and Absolute Risk (1mark)
6. Incident and Accident (1mark)
7. i. Define the term risk (1mark)

ii. Identify two types of risks and give examples. (4marks)

(3marks)

1. i. Identify three reasons why process safety management was developed by OSHA. (3marks)

ii. Outline four elements of process safety management. (2marks)

**QUESTION TWO (20 MARKS)**

Discuss the following process hazard analysis techniques

1. Fault Hazard Analysis
2. Fault Tree Analysis
3. Common cause failure Analysis
4. Failure modes effects and criticality Analysis
5. Checklist analysis

**QUESTION THREE (20 MARKS)**

1. Describe three drivers of change (3marks)
2. Outline five stages of risk management (5marks)
3. Discuss the stages of change management systems (4marks)
4. Discuss four problems of existing management systems (4marks)
5. Describe the four P’s elements of work that should be considered when managing risks (4marks)

**QUESTION FOUR (20 MARKS)**

Discuss the role of hazard identification in quality reliability centred maintenance and safety instrumented systems (20marks)

**QUESTION FIVE (20 MARKS)**

Discuss the following:

1. Failure frequency estimation (5marks)
2. Probability Theory (5marks)
3. Risk matrix and risk comparisons (5marks)
4. Categories of hazards (5marks)