INTERNATIONAL UNIVERSITY OF EAST AFRICA
'Learning to Succeed'

FACULTY OF ENGINEERING

END OF SEMESTER EXAMINATIONS - APRIL 2025

PROGRAMME: BACHELOR OF PETROLEUM ENGINEERING

YEAR/SEM: YEAR 3/SEMESTER 2

COURSE CODE: PTE3254

NAME: ENVIRONMENTAL MANAGEMENT IN PETROLEUM INDUSTRY

DATE: 2025-04-16

TIME: 2:00-5:00PM

INSTRUCTIONS TO CANDIDATES:

1. Read the instructions very carefully
2. The time allowed for this examination is STRICTLY three hours
3. Read each question carefully before you attempt and allocate your time equally between all the Sections
4. Write clearly and legibly. Illegible handwriting cannot be marked
5. Number the questions you have attempted
6. Use of appropriate workplace examples to illustrate your answers will earn you bonus marks
7. Any examination malpractice detected will lead to automatic disqualification.

DO NOT WRITE ANYTHING ON THE QUESTION PAPER

Section A Attempt any TWO (2) Questions from Section A. Each question carries 20 marks. Any unclear handwriting will lead to loss of marks

Question 1:

a) What are the socio-economic benefits of oil and gas exploration in developing regions?
b) Discuss the cultural challenges faced by local communities during oil exploration.
c) What health impacts might occur in populations living near exploration sites?
d) Propose strategies to address socio-economic and cultural concerns.

Question 2:

a) Explain the causes of oil spills during exploration and production.
b) Discuss the short-term and long-term impacts of oil spills on marine biodiversity.
c) Highlight international laws and conventions addressing oil spills.
d) Propose strategies for effective oil spill response and cleanup.

Question 3:

a) What are the major atmospheric pollutants from oil and gas operations?
b) Explain the role of flaring and venting in atmospheric pollution.
c) Discuss the contribution of exploration activities to global warming.
d) How can the industry reduce its atmospheric emissions?

Question 4:

a) Identify the main pollutants generated during oil and gas exploration.
b) What are the sources of these pollutants?
c) How do these pollutants impact local ecosystems?
d) Suggest methods to reduce the release of pollutants during operations)

Section B Attempt any THREE (3) Questions from Section B. Each question carries 20 marks. Any unclear handwriting will lead to loss of marks

Question 1:

a) Define the role of international regulatory frameworks in the petroleum industry.
b) Discuss two key international regulatory organizations or agreements that influence the global petroleum industry.
c) How do regional regulatory frameworks differ from international ones in terms of their implementation?
d) Explain the significance of regional regulatory frameworks in addressing local environmental and safety concerns in petroleum operations.
e) Provide an example of a regional regulatory framework and describe its primary goals.
f) Discuss the challenges associated with harmonizing international and regional regulatory frameworks in the petroleum sector?

Question 2:

a) What is the role of national governments in regulating the petroleum industry?
b) Discuss the main components of a national regulatory framework for petroleum exploration and production.
c) Explain the concept of "resource nationalism" and its impact on national petroleum regulations.
d) How do national frameworks address environmental protection in petroleum extraction?
e) Describe the relationship between national regulatory frameworks and corporate governance in the petroleum industry.
f) Identify and discuss challenges that national governments face when implementing petroleum regulations.

Question 3:

a) What is decommissioning in the context of oil and gas wells, and why is it necessary?
b) Discuss the key steps involved in the decommissioning of an oil or gas well.
c) Explain the importance of well abandonment procedures and their role in preventing environmental damage.
d) How can petroleum companies ensure the successful rehabilitation of decommissioned wells?
e) What are the challenges associated with decommissioning old or offshore wells?
f) Provide an example of a decommissioning and rehabilitation project and describe the environmental benefits it achieved?

Question 4:

a) What is produced water, and why is it considered a major waste product in the petroleum industry?
b) Discuss the methods used to treat and manage produced water in the petroleum industry.
c) Explain the potential environmental impacts of improperly disposed produced water.
d) What are the common techniques for solid waste disposal in petroleum operations?
e) How can solid waste, such as drilling cuttings, be treated and disposed of in an environmentally responsible manner?
f) Compare the environmental benefits and drawbacks of on-site waste disposal versus off-site waste disposal in petroleum operations.