

The Open University of Sri Lanka
Faculty of Engineering Technology



Study Programme : Bachelor of Science Honours in Engineering
Name of the Examination : Final Examination
Course Code and Title : DMX6302 Energy, Environment and Sustainability
Academic Year : 2023/24
Date : 5th February 2025
Time : 1330 hrs-1630hrs
Duration : **3 hours**

General instructions

1. Read all instructions carefully before answering the questions.
2. Answer all **ten (10)** Questions. All questions carry equal marks.
3. This is a Closed Book Test (CBT).
4. Answers should be in clear handwriting.
5. Do not use Red colour pen.

-
- Q1 Industries rely on various energy conversion processes to operate efficiently. Identify and describe four key energy transformation processes used in industrial applications, along with practical examples. . (10 marks)
- Q2 Energy storage plays a key role in ensuring a reliable and efficient energy supply. Outline and explain different types of energy storage methods used in industries and power systems. (10 marks)
- Q3 As a renewable energy source, plant-based biomass plays a significant role in sustainability. Describe its environmental effects and long-term viability by considering aspects such as land use, energy input requirements, technological advancements in conversion, storage and handling issues, and the reliability of biodiesel production. (10 marks)
- Q4 Explain the role of hydropower in sustainable energy production and its environmental implications. (10 marks)

- Q5 Discuss the key barriers to widespread adoption of renewable energy sources. Suggest possible solutions. (10 marks)
- Q6 Both nuclear fission and fusion involve changes to atomic structure and the release of energy, yet they operate through distinct processes. How do these reactions differ in terms of their mechanisms, energy yield, and real-world uses?. (10 marks)
- Q7 What are the environmental impacts of nuclear power generation, and how do they compare to fossil fuel-based energy sources? (10 marks)
- Q8 Name major pollutants released during the fractional distillation of crude oil. How do they affect ecosystems and human health? (10 marks)
- Q9 Discuss the social and health effects of petroleum extraction on local communities near drilling sites. (10 marks)
- Q10 “While nuclear power is a cleaner and more efficient alternative to fossil fuels, it is not a perfect solution. A balanced approach combining nuclear energy with renewables (solar, wind, hydro, and geothermal) can lead to a more sustainable and low-carbon energy future”. Comment on above statement giving pros and cons. (10 marks)

All rights reserved