THE OPEN UNIVERSITY OF SRI LANKA

Faculty of Engineering Technology

Department of Mathematics and Philosophy of Engineering

Bachelor of Science Honours in Engineering
Bachelor of Software Engineering Honours
Bachelor of Industrial Studies Honours

Final Examination (2022/2023)

MHJ5342/MHJ5372: TECHNOLOGY, SOCIETY AND ENVIRONMENT

(Open-book Examination)

Date: 25th February 2024 (Sunday) **Time: 13:30 hrs. – 17:30 hrs.**

Please answer a total of six questions only.

Answer at least two questions from Part B

Answers for questions in Part A should be in a single answer book and each answer in Part B should be in separate answer books. Clearly mark your index number on each answer book.

Please DO NOT copy directly from a text. If you have to quote, please do so within inverted commas.

Part A

Q1.

Washington Accord, the guideline used by the IESL for engineering education, identifies skills needed by engineers under 12 titles: Engineering Knowledge, Problem Analysis, Design/ Development of Solutions, Investigation, Modern Tool Usage, **The Engineer and Society**, **Environment and Sustainability**, Ethics, Individual and Teamwork, Communication, Project Management and Finance and Lifelong learning. While the first five skills are more related to technical skills and the last five are related to skills needed to work within the engineering community, write an essay discussing the importance of other two skills, **The Engineer and Society** and **Environment and Sustainability**, to perform well as an engineer. (100 marks)

Q2.

Sri Lanka never was a production economy. Our focus was on agriculture and then was on service sector. Discuss,

(a) The link a production economy has with Research and Development (R&D) sector by taking examples, (50 marks)

(b) What needs to be done to strengthen the R&D sector within the Sri Lankan context. (50 marks)

Q3.

Use your knowledge on entropy and the second law of thermodynamics you have gained during the year by following MHJ5342/MHJ5372 to argue that there is a limit to the expansion of industrial activity in the world. (100 marks)

Q4.

Women are underrepresented in industrial sector. Discuss why. (100 marks)

Q5.

Can we trust conclusions of research conducted on health impacts of mobile phones? Discuss. (100 marks)

Q6.

There seems to be three schools of thought when it comes to energy use. The first assumes the world could function business as usual and there is no need to worry about the evaporation of global oil, coal and natural gas stocks as the human creativity is capable of finding other sources of energy. The second suggests that the oil, coal and natural gas stocks will be over at some point and we need to shift to renewable energies sooner or later. The third argues that the idea of renewability is an illusion and the technologies used to tap renewable energies are not renewable and the only option available to humankind is to move towards simple lifestyles. What is our opinion about these three schools of thought. Argue your case. (100 marks)

Q7.

Even though many preach the importance of environmental protection, they violate what they preach in their practical lives. Write an essay describing such violations in their personal, public, and professional lives. (100 marks)

Part B

Q8.

The warming of the earth causes various regeneration processes that affect changes in the climate system. Increased concentration of water vapour in the atmosphere and the decrease in surface covered with snow and ice cause additional warming.

a) What is meant by the natural carbon cycle? (25 marks)
b) Global warming can at best be limited to 1.5 °C, adaptation to the impacts of climate change is becoming increasingly important. Briefly explain how we can contribute to reduce global warming effects at individual level. (50 marks)
c) How does the greenhouse effect work? (25 marks)

Q9.

Sustainable development can be defined as a commitment to meet the needs of present without compromising the ability of future generations to meet their own needs.

a) What is meant by the needs of the present here in the definition of sustainable development? (25 marks)
b) What do you understand by "without compromising the ability of future generations to meet their own needs"? (25 marks)
c) In your opinion are we drifting towards a sustainable future or not? Explain. (50 marks)

Q10.

a) Mention major steps of the current EIA procedures? (10 marks)
b) Briefly explain each step of scoping process under EIA procedures. (50 marks)
c) What are the challenges for conducting EIA in Sri Lanka? (10 marks)

d) What are the key benefits of conducting Strategic Environmental Assessment (SEA)? (10 marks)

e) Briefly explain key steps of conducting SEA. (20 marks)

Q11.

There are many approaches to appreciating 'environmental aesthetics'. One such approach is to consider the environment as an aesthetic composition.

a) How do you define 'composition' in aesthetics? (20 Marks)

b) Briefly describe the following fundamental characteristics of a composition.(20 marks)

   i. Unity

   ii. Balance

   iii. Harmony & contrast

   iv. Rhythm

c) Select a place or location familiar to you. It can be an urban city, heritage city, countryside, picturesque beach, mountains or any other place.

   i. Describe the aesthetics of the visual environment of that place, explaining prominent visual elements of the place and characteristics such as rhythm, balance, harmony/contrast, and unity of the composition. You may give examples. (30 marks)

   ii. Write a short essay on visual pollution describing how the aesthetics of the selected place can be destroyed due to new additions to that context such as billboards, structures, and other ways. (30 marks)

- The End -