



# UNIVERSITY OF RUHUNA

## Faculty of Engineering

End-Semester 1 Examination in Engineering: December 2023

Module Number: IS1301 [C-18]

Module Name: Communication for Engineers

[Three hours]

[Answer all questions in the answer booklet provided. Each question carries 12 marks]

Q1. a) Complete the following sentences with the correct form of the verb in the brackets.

- i. Engineering \_\_\_\_\_ (be) a profession that has many different areas and specializations.
- ii. The most inspiring part of \_\_\_\_\_ (be) an engineer is that you can be very creative as a professional.
- iii. Many people \_\_\_\_\_ (draw) to landscape architecture to be creative, but many realize it is more than just creating.
- iv. Engineers \_\_\_\_\_ (spend) time in the office, but they also travel to see new places, projects, nurseries, quarries, workshops, factories, and much more.
- v. Engineering is a challenging profession. You need to be a generalist who \_\_\_\_\_ (know) different areas of expertise.
- vi. It can be challenging when \_\_\_\_\_ (balance) environmental, social and economic issues whilst creating a design and working with people who have differing viewpoints.
- vii. The transport line from Paris to Strasbourg \_\_\_\_\_ (open) in 1859 and stopped working in 1969.
- viii. A section of the railway line with a length of about 4.5 km \_\_\_\_\_ (reconstruct) to create a linear park.
- ix. Reconstruction of the building by the architect Philippe Mathieu and the landscape architect Jacques Vergeli \_\_\_\_\_ (begin) in 1988.
- x. The new city center \_\_\_\_\_ (be) an extended structure of a green public space.
- xi. The new city center \_\_\_\_\_ (become) a place of attraction for a large flow of people due to a wide opportunities provided.
- xii. At the new city center, there \_\_\_\_\_ (be) also playgrounds, and even a small "theater" in which residents of neighboring houses arrange their holidays.

(6 Marks)

b) Transform the following sentences into passive voice.

- i. They are pulling down the old theatre.
- ii. He acknowledged their proposal with gratitude.
- iii. They will be discussing a very important question in the meeting tomorrow.
- iv. A separate report addresses the issues regarding over-crossing bridges in the area.
- v. The students are preparing a project proposal now.
- vi. ~~Workers were setting up a road block when I passed through.~~
- vii. They are building a new road here.
- viii. The engineer was making a plan to complete the project before the deadline.
- ix. The government will introduce new measures against crime.
- x. The chief engineer examined the new construction site.
- xi. The judge gave him two weeks to pay the fine.
- xii. The government is spending little money on roads.

(6 Marks)

[Total - 12 Marks]

Q2) Read the passage and answer the questions given below in complete sentences.

#### Robots – Machines like us

Robots – machines capable of carrying out a complex series of actions automatically – have gone from a science fiction concept to a part of everyday life. These machines show up everywhere from children's toys to exploration vehicles on Mars. Robots are important in many fields, including the manufacturing, automotive, and medical industries.

Most robots do not look particularly similar to humans, but they do share several qualities with people. Essential characteristics of a robot include the ability to sense its surroundings, the ability to move, and some kind of intelligence. Because these qualities are similar to human characteristics, understanding the human body helps engineers develop robots. Engineers research the human body and try to build robots that imitate the way a body functions.

In fact, robots have many aspects similar to the human body. To start, a person may sense the surrounding world using eyes, ears, nose, tongue, and skin that responds to touch. A robot may have sensors that respond to light, sounds, pressure, and chemicals in the air or on surfaces. Next, a human has a brain that responds to this sense information and controls reactions. A robot has a control system and programs designed to respond to similar information. Finally, the human brain gives commands to the muscles via the nervous system, causing movement. A robot's computer "brain" decides on appropriate

reactions for the robot "body." The control system gives commands to its moving parts through a computer program, causing movement.

The principles used in robotics are also useful for understanding the human body. The human body can be viewed as a functioning, controlled system, similar to a robot. Scientists who use this concept in their work are participating in biological engineering.

Biological engineering, or bioengineering, applies scientific principles to living systems. For example, a biological engineer might design machines that produce food, build a system to improve water quality, or work on medical equipment. All of these advances can help people, but some biological engineers are working more directly to benefit the human body. The advances in medicine are especially impressive. Some surgeons are already using robots to help perform delicate surgeries. The surgeon may manipulate a control system across the room, while the robot performs the actual surgery. The robot can have much smaller "hands" that can control miniature tools. This allows for more precise procedures that cause less damage to the body.

Biological engineering has many more benefits to medical research. For example, an artificial body part can help replace limbs, organs, or skin lost due to an accident or disease. However, making the artificial part function in a natural way is complicated. It may require integrating human and robotic senses, control systems, and moving parts. One group of researchers is developing artificial skin that can detect pressure. This skin could be used on people who have lost feeling in parts of their body. It could also allow people with artificial limbs to feel what the limb is touching by sending an electric pulse to the brain-cells that recognize touch. Finally, the technology may also be used on robots to help them function better. It's an advance that helps people and robots both by taking advantage of the similarities in each.

Biological engineering is a relatively new branch of science. It is growing and changing quickly, providing many career opportunities. The field combines elements of computer science, chemistry, biology, and other branches of engineering. This makes it ideal for young people with a strong interest in science and computers. People who choose to study bioengineering can find work in many fields, from health care to environmental protection. In many cases, biological engineers will work with robots. These robots may or may not look anything like human beings, but on some level, they will function a lot like us.

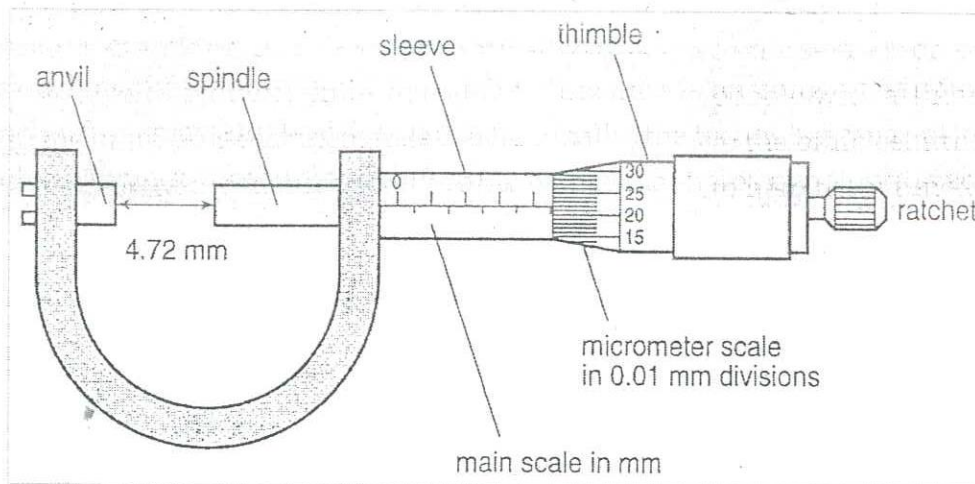
*(Source: <https://www.readingvine.com/passages/machines-like-us/>)*

- i. What is the main idea of this passage? (1 Mark)
- ii. According to the passage, what are the essential characteristics of a robot? (1 Mark)

- iii. What are some of the aspects human body and robots are similar? Use details from the passage to support your answer. (2 Marks)
- iv. The passage claims that biological engineering has made impressive advances in medicine. What evidence is given to support this statement? (1 Mark)
- v. According to paragraph 6, can artificial body parts function in a natural way? Explain in your own words. (1 Mark)
- vi. How do surgeons use robots to perform surgeries? (1 Mark)
- vii. What qualities would make someone a good biological engineer? (1 Mark)
- viii. Write grammatically correct sentences to bring out the meaning of the following words (Do not take sentences from the above text).
  - a) Principle
  - b) Integrate (4 Marks)

[Total - 12 Marks]

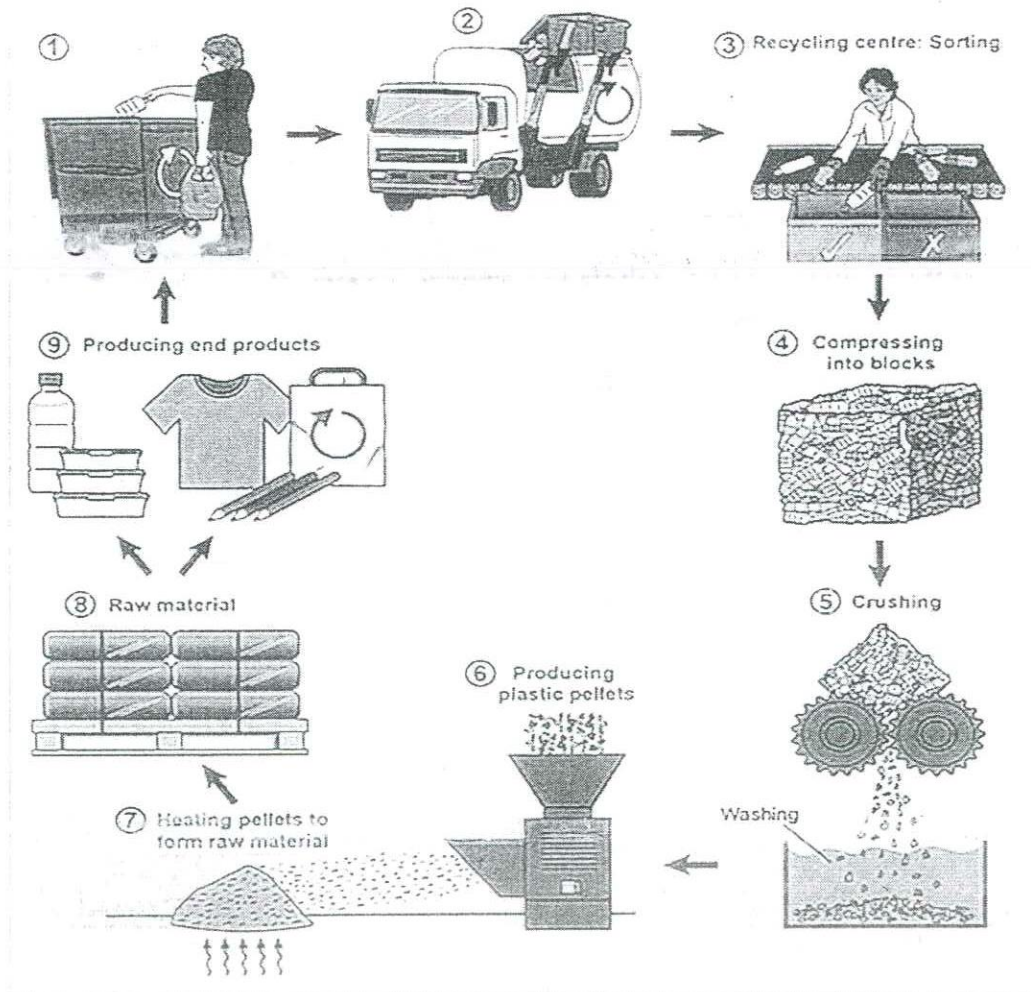
Q3) a) Write a paragraph describing the measuring tool below. Use about 100-110 words.



(Source: <http://gabrielyapscience.weebly.com/science-lessons-blog/>)

(6 Marks)

b) The diagram below shows the process for recycling plastic bottles. Write a paragraph explaining the process by referring to the diagram. Use about 140-150 words.



(Source: <https://www.ieltsessaybank.com/process-for-recycling-plastic-bottles/>)

(6 Marks)

Q4) Write short paragraphs for the topics given below. Consider the structure, organization, and coherence in developing your paragraph. Use about 100 words per each.

- Can critical thinking change the way you act in real-life situations? (3 Marks)
- Importance of communication skills to be a productive employee (3 Marks)
- Career opportunities in engineering (3 Marks)
- Tips for improving time management and productivity as a student (3 Marks)

[Total - 12 Marks]

Q5) Select one of the topics given below and write an essay. Your essay will be marked for the content, language and organization. Write about 250 words.

- a) Are humans becoming slaves to modern technology and social media? Critically discuss with examples.
- b) The importance of effective communication in leadership
- c) The role of professional engineers to uplift Sri Lanka's economy and sustainable development
- d) The impact of Artificial Intelligence (AI) on the future job market
- e) Individual learning versus group learning: Pros and cons

[Total - 12 Marks]