UNIVERSITY OF RUHUNA

Faculty of Engineering

End-Semester 1 Examination in Engineering: March 2026

Module Number: IS1301 **Module Name: Communication for Engineers [C-23]**

[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. By the time the inspection team arrived, the engineers _____ already _____ (assemble) the prototype.
ii. While the technicians were testing the system, the software developers _____ (troubleshoot) a critical software error.
iii. The research group said that they _____ (optimize) the solar panel efficiency since last year.
iv. Before the project was approved, the design team _____ (redesign) the entire structure.
v. By next year, the company _____ (automate) most of its manufacturing processes.
vi. The engineers reported that they _____ (compile) the diagnostic data immediately after the fault was detected.
vii. While the engineers were testing the dam sensors, they suddenly _____ (detect) abnormal pressure levels.
viii. When the bridge inspection began, the technicians _____ (examine) the support cables.
ix. If safety rules are ignored, accidents _____ (occur) frequently at construction sites.
x. The chief engineer said that the new highway project ____ (reduce) traffic congestion.
xi. The supervisor asked whether the workers _____ (finish) the repairs before the inspection.
xii. The supervisor said that the technicians _____ (attempt) to restore electricity to hospitals because of the planned power cuts next week.

[6.0 Marks]

b) Transform the following sentences into passive voice.

i. The mechanic will carefully inspect all the car engines in the workshop tomorrow morning.
ii. The workshop team had painted the machine parts before assembly.
iii. The engineers are measuring the temperature of the metal components.
iv. The technicians cleaned the workshop tools after the shift.
v. The researcher is recording the results of the test.
vi. The supervisor checked the quality of the welds yesterday.
vii. The lab assistant has prepared the required materials for the experiment.
viii. The instructor demonstrates the correct use of hand tools to the students.
ix. The trainees were observing the milling process during the practical session.
x. The technicians had lubricated the gears before the machine started operating.
xi. Engineers can simulate complex fluid dynamics using specialized software.
xii. The maintenance crew replaced the worn-out gears after the machinery failure.

[6.0 Marks]

Q2. Read the passage and answer the questions given below.

The Modern Use of Drones in Warfare

In recent years, drones, also called Unmanned Aerial Vehicles (UAVs), have become increasingly important in modern warfare and military operations. Originally developed for reconnaissance and surveillance, drones have evolved into highly versatile tools capable of performing a wide range of missions. Because drones operate without a human pilot onboard, militaries can reduce risks to personnel while carrying out operations efficiently in dangerous or complex environments. Today, drones are employed not only by large armed forces but also by smaller defense units and international allies, reflecting their growing strategic significance.

One of the main advantages of drones in military operations is their ability to gather intelligence. Equipped with high-resolution cameras, thermal imaging sensors, and radar systems, drones can monitor enemy movements, locate targets, and provide real-time information to military commanders. This capability allows forces to plan operations carefully and react quickly to unexpected threats. For example, in Afghanistan, UAVs such as the MQ-1 Predator were used extensively to track insurgent movements in areas where ground access was limited or too risky. The intelligence collected helped military leaders make informed decisions while minimizing danger to soldiers.

Drones are also widely used in combat missions. Armed UAVs can carry missiles or precision-guided bombs, allowing militaries to strike targets accurately while reducing unintended damage. Unlike traditional airstrikes, drones can hover over a location for extended periods, waiting for the optimal moment to attack. In

2015, the United States military successfully used drones to eliminate high-profile terrorist leaders without endangering ground troops. This precision capability has made drones a key instrument in counterterrorism operations, especially in regions where avoiding civilian casualties is critical.

Beyond reconnaissance and combat, drones support logistics and supply operations. Military drones can deliver food, medical kits, or ammunition to troops in remote or contested zones. This reduces the need for manned convoys, which are vulnerable to ambushes or improvised explosive devices (IEDs). For instance, the Israeli Defense Forces have used drones to transport emergency medical supplies to soldiers in hard-to-reach locations. Some advanced drones can carry hundreds of kilograms, making them essential for sustaining frontline operations for longer periods.

Modern military drones also feature autonomous flight and artificial intelligence (AI). Many UAVs can follow programmed routes, avoid obstacles, and adapt to changing conditions without direct human control. AI systems can analyze vast amounts of surveillance data in real time, highlighting critical information for commanders. However, this level of automation raises ethical and strategic questions. Experts debate the potential consequences of fully autonomous drones making life-or-death decisions without human supervision.

Despite their advantages, drones have certain limitations. They rely on satellite communications and GPS, which can be disrupted by electronic attacks or environmental interference. Harsh weather conditions can reduce their effectiveness, and small drones can be vulnerable to anti-aircraft systems. Nevertheless, research continues to improve their resilience, stealth, and operational range, with countries such as China and Russia actively developing next-generation UAVs.

In conclusion, drones have transformed modern military operations. From intelligence gathering to combat and logistics, UAVs provide strategic advantages while reducing risks to human personnel. As technology advances and operational scenarios evolve, drones are likely to play an even larger role in warfare, presenting both opportunities and challenges for future military planning.

(Source: https://researchcentre.army.gov.au/library)

a) According to the text, what are the two main uses of drones in military operations? [1.0 Mark]

b) Why are drones considered safer than manned aircraft in military operations? [1.0 Mark]

c) Name three types of sensors that help drones gather intelligence effectively. [1.0 Mark]

d) According to the text, what are the three capabilities of autonomous drones? [1.0 Mark]

e) How does artificial intelligence enhance the functionality of drones?

[1.0 Mark]

f) Give three examples from the passage where drones were used in real-world operations.

[1.0 Mark]

g) What ethical concern related to the use of autonomous drones is mentioned in the text?

[1.0 Mark]

h) Mention two challenges that limit the effectiveness of drones.

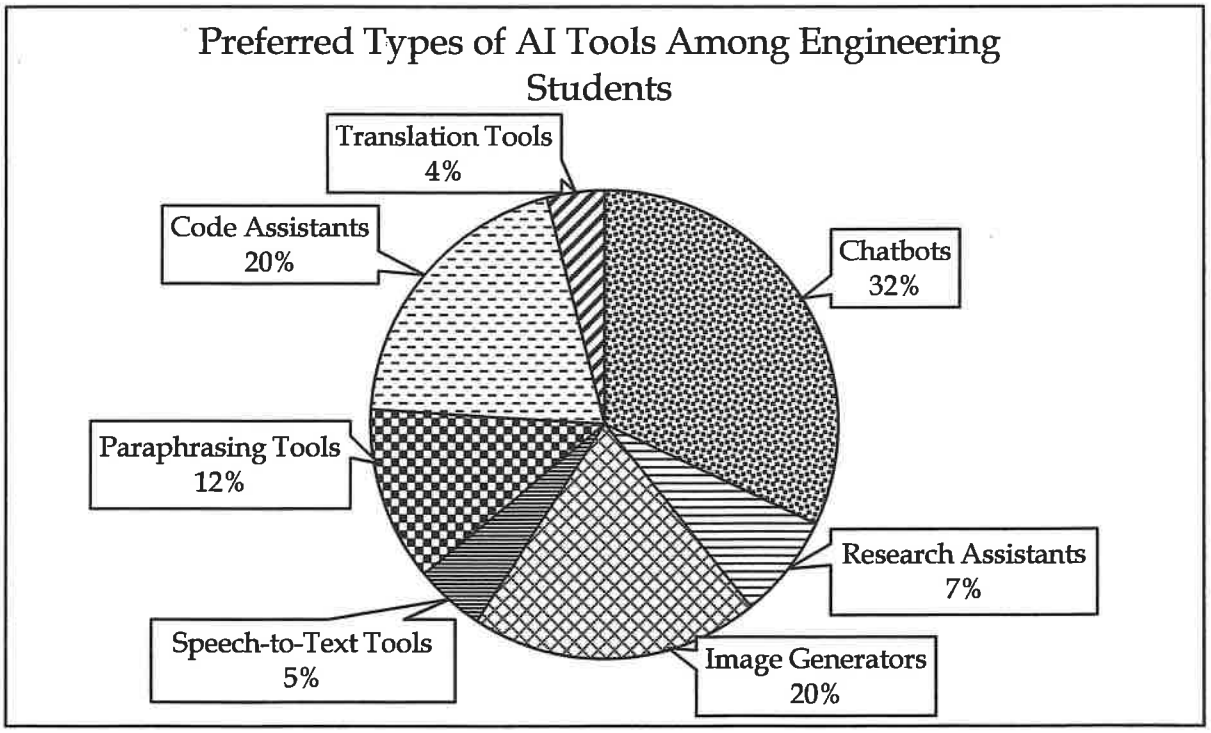
[1.0 Mark]

i) Write grammatically correct sentences to bring out the meaning of the following words (Do not take sentences from the above text).

   i. surveillance

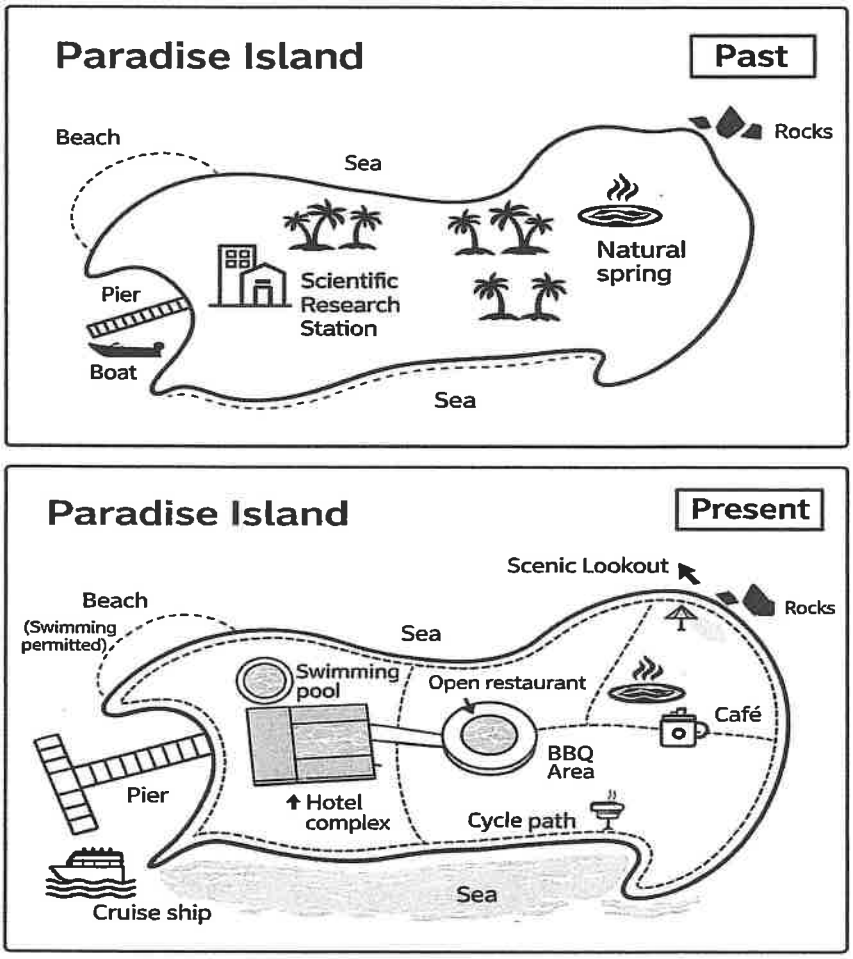
   ii. versatile [4.0 Marks]

Q3. a) The pie chart below shows the distribution of preferred AI tool types among 125 students from the Faculty of Engineering at a state university in 2026. Summarize the information by selecting and reporting the main features, and make comparisons where relevant. Use about 140-150 words.



[6.0 Marks]

b) The diagram below shows the condition of Paradise Island in the past and how it appears now. Write a descriptive paragraph that summarizes the main changes and key features, comparing how the landscape, facilities, and environment have developed over time. Use about 100–110 words.



(Source: https://engnovate.com)

[6.0 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.

a) The importance of maintaining regular attendance in university courses [3.0 Marks]

b) The key steps in preparing for a successful poster presentation [3.0 Marks]

c) The role of empathy in successful group projects [3.0 Marks]

d) The importance of transparency in risk communication [3.0 Marks]

Q5. Select **one** of the topics given below and write a well-structured essay using relevant examples. Your essay will be assessed based on content, language, and organization. Write about 250 words.

a) "University education is not only about academics but also about life skills." Discuss.
b) How do engineering exhibitions promote innovation and creativity among students? Explain with relevant examples.
c) "Failure is a stepping-stone to success." Discuss this statement with reference to your university experience.

[12.0 Marks]