



# **MURANG'A UNIVERSITY OF TECHNOLOGY**

## **SCHOOL OF ENGINEERING AND TECHNOLOGY**

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNIVERSITY ORDINARY EXAMINATION

2023/2024 ACADEMIC YEAR

**FOURTH YEAR SECOND SEMESTER EXAMINATION FOR BACHELOR  
OF SCIENCE IN ELECTRICAL AND ELECTRONICS ENGINEERING**

**EET615: WIRELESS COMMUNICATION AND NETWORKING**

**DURATION: 2 HOURS**

### **INSTRUCTIONS TO CANDIDATES:**

1. Answer Question one and any other two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

## **SECTION A: ANSWER ALL QUESTIONS IN THIS SECTION**

### **QUESTION ONE (30 MARKS)**

- a) Explain the three GPRS/GSM classes (9marks)
- b) Use a diagram to explain the process of migrating from IPv4 to IPv6 (8marks)
- c) Sketch any two WPAN topologies and explain the function of each WPAN device present in these topologies (8marks)

## **SECTION TWO: ANSWER ANY TWO QUESTIONS**

### **QUESTION TWO (20 MARKS)**

- a) Sketch the general architecture of the GPRS system and explain any two of its benefits compared to the GSM technology (10marks)
- b) Wi-Fi is one of key technologies in wireless communication
  - i. Explain this technology (2marks)
  - ii. Use sketches to explain the two Wi-Fi topologies commonly used. (6marks)
- c) Explain the server-side programming and highlight any two of its benefits (7marks)

### **QUESTION THREE (20 MARKS)**

- a) Define the term “Local Loop” and explain the motivation for using the wireless local loop compared to its predecessor. (5marks)
- b) Explain the Zigbee technology and highlight any three of its benefits (8marks)
- c) Sketch the overall architecture of the GSM system and explain the function of the Network subsystem. (12marks)

### **QUESTION FOUR (20 MARKS)**

- a) Discuss a WPAN and differentiate it from WLAN (4marks)
- b) With regard to GSM technology, explain any two conditions that are necessary for handover. (4marks)
- c) Describe actions taken for communication when a mobile station moves from one BS to a second BS connected to a different mobile switching centre. (12marks)

- d) Explain the W-CDMA system and compare it (5marks)

**QUESTION FIVE (25 MARKS)**

- a) Discuss any four benefits of WLANs (10marks)
- b) The personal communication service (PCS) architecture consists of two main sections. Using a sketch, explain the two sections and their associated devices (9marks)
- c) The wireless Application protocol's WTLs layer implements a security protocol based on a TKs industry standard. Explain any three features of the WTLs layer. (6marks)