



JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE AND TECHNOLOGY

SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS

DEPARTMENT OF INFORMATION SYSTEMS

**UNIVERSITY EXAMINATION FOR THE DEGREE BACHELOR OF
INFORMATION COMMUNICATION AND TECHNOLOGY
YEAR THREE: SEMESTER ONE**

2ND YEAR 2ND SEMESTER 2024/25 ACADEMIC YEAR

MAIN CAMPUS

COURSE CODE: ITB 1204

COURSE TITLE: WIRELESS INTERNET APPLICATIONS

DATE: 16/4/2024

SESSION 9.00-11.00

VENUE: CL 1

TIME: 2 HOURS

INSTRUCTIONS

1. Answer Question 1 (Compulsory) and ANY other TWO questions
2. Candidates are advised not to write on the question paper
3. Candidates must hand in their answer booklets to the invigilator while in the examination room

QUESTION ONE (30 Marks)

- a) Define Wireless Internet Application and explain its role in modern networking. **(5 Marks)**
- b) Describe the key differences between 1G, 2G, 3G, 4G, and 5G cellular networks. **(10 Marks)**
- c) c) With the help of a diagram, explain the architecture of a typical wireless network, highlighting its key components. **(5 Marks)**
- d) d) Discuss the challenges associated with wireless communication, particularly in mobile environments. **(5 Marks)**
- e) a) Explain the principles of electromagnetic wave propagation and its impact on wireless communication. **(5 Marks)**

SECTION B: ANSWER ANY TWO QUESTIONS

QUESTION TWO (20 Marks)

- a) Define Mobile Ad Hoc Networks (MANETs) and Vehicular Ad Hoc Networks (VANETs). Discuss their applications in real-life scenarios. **(8 Marks)**
- b) Compare and contrast WiMAX and Wi-Fi regarding technology, range, and application areas. **(8 Marks)**
- c) Explain the principles of electromagnetic wave propagation and its impact on wireless communication. **(4 Marks)**

QUESTION THREE (20 Marks)

- a) What are the primary multiple access control mechanisms used in wireless networks? Compare FDMA, TDMA, CDMA, and OFDMA. **(8 Marks)**
- b) Discuss the Mobile IP concept and explain how it enables seamless mobility for users. **(6 Marks)**
- c) Evaluate the role of IoT (Internet of Things) in wireless networks and discuss three (3) key applications. **(6 Marks)**

QUESTION FOUR (20 Marks)

- a) Explain the architecture and components of an IoT-based wireless system. **(8 Marks)**

- b) Discuss the importance of security in wireless applications and explain three (3) key security threats in wireless networks. **(6 Marks)**
- c) What are wireless middleware technologies? Discuss their significance in mobile application development. **(6 Marks)**

QUESTION FIVE (20 Marks)

- a) Explain the concept of Quality of Service (QoS) in wireless networks and describe three (3) key QoS parameters. **(8 Marks)**
- b) Describe the role of Bluetooth and Zigbee in wireless personal area networks (WPANs). **(6 Marks)**
- c) What are the advantages and disadvantages of Mobile Cloud Computing in wireless applications? **(6 Marks)**

JUST OBSERVES ZERO TOLERANCE TO EXAM CHEATING