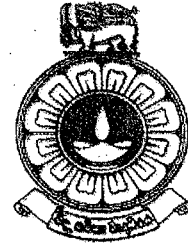


THE OPEN UNIVERSITY OF SRI LANKA
DEPARTMENT OF COMPUTER SCIENCE
BSC DEGREE PROGRAM – 2025/2026
FINAL EXAMINATION
CSU5312: Wireless & Cellular Networks
DURATION: TWO HOUR (2 HOURS)



Date: 25.11.2025

Time : 1.30pm - 3.30pm

General Instructions

1. Read all instructions carefully before answering the questions.
2. This question paper consists of 06 questions on 04 pages.
3. Answer any 04 questions only. All questions carry equal marks.
4. The answer for each question should commence from a new page.
5. Draw fully labeled diagrams where necessary.
6. Involvement in any activity that is considered an exam offense will lead to punishment.
7. Use blue or black ink to answer the questions.
8. Clearly state your index number in your answer script.

Question 01

- I. Briefly discuss the three fundamental signal properties that significantly affect antenna design.
- II. Explain four major processes that optimize the performance of the antenna system.
- III. Discuss how each of the listed antenna processes contributes to optimizing overall antenna performance.
- IV. State the four types of antennas with their unique application for each.

Question 02

- I. Briefly describe the three major components of WLAN Architecture.
- II. Describe four key elements of WLAN architecture with their function.
- III. Compare and contrast the following terms,
 - a. Infrastructure mode vs Ad-hoc mode
 - b. Home Location registry vs Visitor location registry
- IV. Describe the four major security protocols implemented in WLAN technology.

Question 03

- I. State three major limitations of traditional communication technologies that have been effectively addressed by cellular communication systems.
- II. Briefly discuss the five cellular topologies with their function.
- III. Identify the most suitable cell type for the following areas,
 - a. In-Home
 - b. In-Building
 - c. Urban area
 - d. Sub-Urban area
- IV. Discuss how the key components of a cellular communication system contribute to creating an efficient and reliable communication.

Question 4

- I. Describe the main components of satellite internet technology by considering how they work together to establish connectivity between users and the internet.
- II. Discuss the advantages and disadvantages of satellite internet compared to traditional broadband communication systems.
- III. Briefly explain the four major applications of satellite internet in different fields such as education, transportation, and disaster management.
- IV. Discuss how satellite internet technology is shaping the future of global communication

Question 5

- I. State the two primary subnetworks that form the core of the 3G architecture.
- II. Explain the process of Signal flow in 3G architecture.
- III. Compare and contrast the architectures of 2G, 3G, and 4G mobile communication systems on a component-wise basis, highlighting the major structural differences among them.
- IV. Read the following scenario , state which numbering systems are being used with their role in this investigation .

Scenario :

A mobile phone was reported stolen. The thief removed the SIM card and inserted a new one, but the police were still able to track the device using the network. Meanwhile, the service provider used subscriber information to temporarily block both incoming and outgoing calls from the old SIM card.

Question 6

- I. Explain four signal propagation methods.
- II. What are the four challenges in Spectrum Allocation, and how are they overcome those challenges.
- III. Differentiate the following terms,
 - a.Noise vs Interference
 - b.Redundancy vs Error checking
- IV. What is an antenna array, and explain the Key concepts behind this antenna array.

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