



MVJ COLLEGE OF ENGINEERING, BENGALURU- 560067

(Autonomous Institution Affiliated To VTU, Belagavi)

**DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING
(DATA SCIENCE)**

CERTIFICATE

This is to certify that the seminar report, entitled “**6G WIRELESS COMMUNICATION SYSTEMS**” is a bonafide work carried out by **CHAITHANYA L (1MJ20CD045)**, a bonafide student of MVJ College of Engineering in partial fulfillment for the award of degree of **Bachelor of Engineering in Computer Science & Engineering (Data Science)** of the Visvesvaraya Technological University, Belagavi during the academic year 2024-2025. It is certified that all the corrections/suggestions indicated for internal assessment have been incorporated into the report. The seminar report has been approved as it satisfies the academic requirements.

Signature of Internal Guide

Prof. Rekha P
Assistant Professor
Department of CSE (DS)
MVJCE

Signature of HOD

Prof. Rekha P
HOD
Department of CSE (DS)
MVJCE



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DECLARATION

I, **CHAITHANYA L (1MJ20CD045)**, hereby declare that the Seminar titled “**6G WIRELESS COMMUNICATION SYSTEMS**” embodied in this report has been carried out by me during the 8th Semester of my B.E degree at MVJCE Bangalore affiliated to VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI. The work embodied in this report is original & it has not been submitted in part or full for any other degree in any University.

CHAITHANYA L

1MJ20CD045

Date:

Place: MVJCE, Bengaluru

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The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without mentioning the people who made it possible. Success is the epitome of hard work and perseverance, but steadfast of all is encouraging guidance.

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ABSTRACT

The exponential growth of connected devices, data-intensive applications, and real-time service demands has driven the evolution of mobile networks toward the sixth generation (6G). As a transformative leap beyond 5G, 6G is envisioned to deliver ultra-high data rates exceeding 1 Tbps, latency under 0.1 milliseconds, massive device connectivity, and native integration of artificial intelligence (AI) for intelligent and autonomous network operations. This paper presents a comprehensive overview of a proposed 6G wireless communication framework designed to meet the demands of emerging applications such as extended reality (XR), autonomous systems, smart cities, and remote healthcare. The system architecture integrates advanced technologies including terahertz (THz) communication, intelligent reflecting surfaces (IRS), edge computing, and quantum-secure communication to enable robust, scalable, and energy-efficient services. The methodology encompasses real-time monitoring, retrospective analysis, and dynamic network optimization through AI-driven orchestration. The paper also explores potential applications, evaluates system performance and robustness under varied conditions, and addresses ethical, regulatory, and accessibility considerations. By aligning cutting-edge innovation with responsible development practices, the proposed system lays the foundation for a highly connected, intelligent, and inclusive digital future powered by 6G.

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