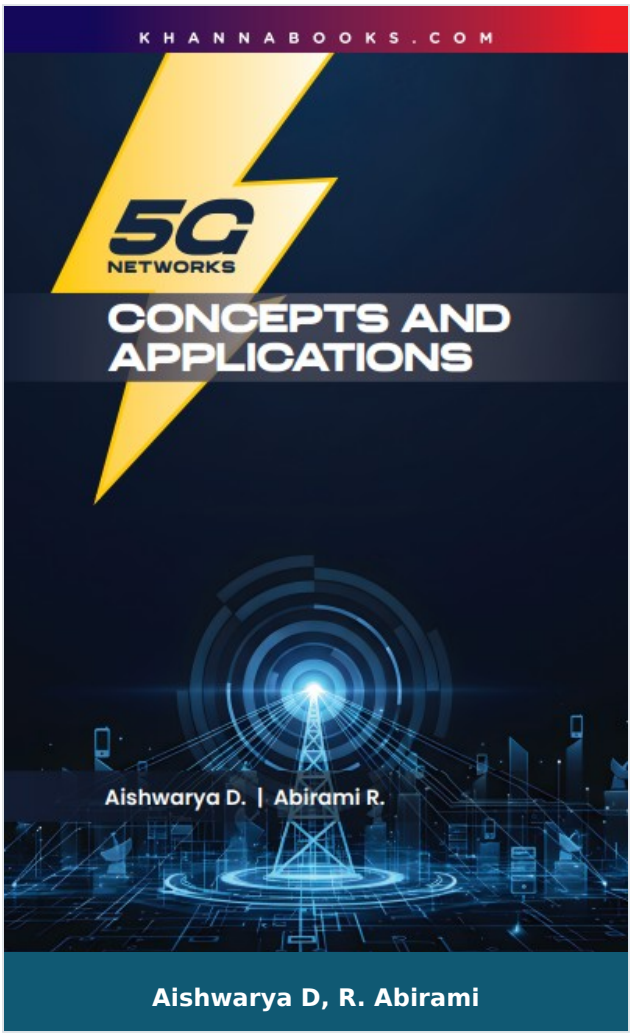

5G Networks: Concepts and Applications

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Product Description

5G Networks: Concepts and Applications

5G: More Than Just Faster Internet

The Fifth Generation of wireless technology, or 5G, is far more than a simple speed boost for your smartphone; it represents a revolutionary shift in how the world connects, communicates, and innovates.

This book is your comprehensive guide to understanding this technological breakthrough. It starts by tracing the journey of mobile communication, from the analog voice calls of 1G and the text messages of 2G to the high-speed streaming of 4G LTE.

You will then dive deep into the heart of 5G, learning about its core features like ultra-fast speeds (up to 10Gbps) and near-zero latency (as low as 1 millisecond). The text clearly explains how these capabilities are transforming major industries:

- Healthcare: Enabling life-saving remote surgeries with robotic precision.
- Transportation: Powering autonomous vehicles that communicate instantly to ensure safety.
- Smart Cities: Managing massive amounts of connected devices, from traffic lights to smart grids.

Whether you are a student, an engineer, or a business leader, this book will equip you with the knowledge to understand both the technical foundations and the immense opportunities unlocked by the 5G network.

Salient Features:

This book is a vital resource designed to demystify 5G and prepare you for the future of connectivity. Key features include:

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- **Generational Overview**: A clear, concise breakdown of the evolution of mobile networks from 1G through the cutting-edge concepts of 6G and beyond.
- **Core 5G Technologies Explained**: Detailed explanations of the crucial technologies that make 5G possible, including Massive MIMO, Beamforming (focused signals), and Network Slicing (custom virtual networks).
- **The Internet of Things (IoT) Blueprint**: A dedicated look at how 5G acts as the essential backbone for the massive growth of IoT, supporting up to a million devices per square kilometer.
- S**pectrum Analysis**: Comprehensive coverage of the three main frequency bands: Low-Band (wide coverage), Mid-Band (balanced speed), and High-Band/mmWave (fiber-like speeds).
- **Real-World Applications**: In-depth case studies and examples of 5G use cases, such as Extreme Mobile Broadband (eMBB) for 4K/8K video streaming and its role in industrial automation and precision agriculture.

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Author

Aishwarya D

Aishwarya D. / Abirami R.

R. Abirami

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