No. of Printed Pages : 4

Sl. No.

B3.E8-R5 : WIRELESS AND MOBILE COMMUNICATION

DURATION : 03 Hours **MAXIMUM MARKS : 100**

Roll No. : | | | | | | |

Answer Sheet No. : | | | | | | |

Name of Candidate : _____ **; Signature of Candidate :** _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, Answer Sheet.
- Question Paper is in English language. Candidate has to answer in English Language only.
- **Question paper contains Seven questions. The Question No. 1 is compulsory. Attempt any FOUR Questions from Question No. 2 to 7.**
- **Parts of the same question should be answered together and in the same sequence.**
- **Questions are** to be answered in the **ANSWER SHEET** only, supplied with the Question Paper.
- **Candidate cannot leave the examination hall/ room without signing on the attendance sheet and handing over his/her Answer Sheet to the Invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respects.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

1. (a) What is mobile communication ? Differentiate between analog and digital modulation techniques in the context of mobile communication.

(b) Explain the basics of wireless antennas.

(c) What are cellular carriers ? Who are the major cellular carriers, and what frequencies do they typically use ?

(d) Explain channel allocation in wireless communication in detail.

(e) What is WLAN connectivity, and how does it relate to Wi-Fi standards ?

(f) What is the role of access points in a Wi-Fi network, and how do they differ from WLAN routers ?

(g) What is a Wireless Sensor Network (WSN), and what are its primary applications and advantages ?

(7x4)

2. (a) Explain the concept of Multiple Access Techniques in Wireless Communication Systems. How do TDMA, FDMA, and CDMA work ? What factors influence the choice of a specific technique in a given wireless network ?

(b) Explain the basics of MIMO (Multiple Input Multiple Output) technology in wireless communication. How does MIMO enhance data rates and communication quality ?

(9+9)

3. (a) Explain the concept of frequency reuse in cellular communication. How does it contribute to the efficient use of the radio spectrum ? What are the challenges in its implementation ?

(b) What are the key technological advancements that have shaped modern wireless communication systems, and how have they contributed to the evolution of 4G and 5G networks ?

(8+10)

4. (a) Explain the evolution of IEEE 802.11 standards, highlighting key advancements introduced in each iteration and their impact on wireless networking.

(b) What is the role of access points in a Wi-Fi network ? How do they differ from WLAN routers ?

(12+6)

5. (a) What do you understand by Network Topology ? Explain common wireless topologies used in Wi-Fi networks, and discuss their advantages and disadvantages.

(b) What is 6LoWPAN (IPv6 over Low-Power Wireless Personal Area Network) ? How does it enable the integration of low-power, constrained devices into IPv6 networks ?

(9+9)

6. (a) What are the primary advantages of using Wireless Sensor Networks (WSNs) in environmental monitoring applications ? How do they contribute to data collection and analysis ?

(b) What is Software Defined Networking (SDN) ? How does it revolutionize network management and configuration ? **(10+8)**

7. (a) Explain the 6G technology and its potential advancements compared to previous generations.

(b) What distinguishes thread from other wireless communication protocols ? What are its advantages in IoT connectivity ? **(9+9)**

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SPACE FOR ROUGH WORK