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Question Paper Code : 40564

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2024.

Fifth/Sixth/Seventh Semester

Electronics and Communication Engineering

CEC 331 – 4G/5G COMMUNICATION NETWORKS

(Common to : Computer and Communication Engineering/ Electronics and Instrumentation Engineering/ Electronics and Telecommunication Engineering)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Brief on the evolution of the radio access network.
2. Define Next-Generation Core.
3. Define 5G technology.
4. What is the role of EPC in 5G networks?
5. Mention the primary purpose of network slicing in 5G architecture.
6. What is GTP-U, and what function does it serve in 5G networks?
7. Define command and control as it relates to network management.
8. State the primary function of mobility management.
9. Give some key security features implemented in 5G networks.
10. What is a flow-based Quality of Service framework?

PART B — (5 × 13 = 65 marks)

11. (a) Compare the 4G and 5G in terms of their architecture and functioning.

Or

- (b) Explain the significance and features of virtualized Evolved Packet Core (vEPC).

12. (a) Provide an overview of the 5G core network architecture and highlight its key components and functionalities.

Or

- (b) Analyze the role of Radio Access Technologies in enabling seamless connectivity and high-speed data transmission in 5G networks.

13. (a) Explain the significance of edge computing in 5G networks.

Or

- (b) Explore the importance of visualizing 5G components in network management and optimization, and discuss the tools and techniques used for visualizing complex 5G architectures.

14. (a) Compare and contrast spectrum sharing and spectrum trading approaches.

Or

- (b) Explore the principles of cognitive radio technology in 5G networks with illustration.

15. (a) Discuss the importance of network domain security in 5G networks.

Or

- (b) What is the need for user domain security? Elucidate the different authentication methods, access control policies, and encryption techniques to safeguard user devices and personal data.

PART C — (1 × 15 = 15 marks)

16. (a) Analyze the impact of cloud technologies on 5G networks and their role in network virtualization, scalability and resource optimization.

Or

- (b) Examine the threats targeting 5G networks and discuss the impact of these threats on network reliability, availability, and trustworthiness.