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Question Paper Code	12570
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B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2024
 Eighth Semester
Electronics and Communication Engineering
20ECEL801 - 5G AND 6G WIRELESS COMMUNICATION SYSTEMS
 Regulation - 2020

Duration: 3 Hours

Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
 Answer ALL Questions

	<i>Marks</i>	<i>K- Level</i>	<i>CO</i>
1. List the Requirements and key performance indicators of 5G.	2	K1	CO1
2. How the Carrier Aggregation is performed.	2	K1	CO1
3. List the purpose of Radio Node Management.	2	K1	CO2
4. Name the High-level requirements for the 5G architecture.	2	K1	CO2
5. Show the IDMA system with its block diagram.	2	K2	CO4
6. Recall Small-cell deployments.	2	K1	CO4
7. How spatial multiplexing is performed?	2	K1	CO5
8. Define beamforming.	2	K1	CO5
9. Compare energy transfer and Harvesting.	2	K2	CO6
10. What is meant by IRSs?	2	K1	CO6

PART - B (5 × 13 = 65 Marks)
 Answer ALL Questions

11. a) Illustrate three generic 5G services and four main enablers of 5G services with suitable diagrams.	13	K2	CO1
OR			
b) Explain in detail about 10 Pillars of 5G.	13	K2	CO1
12. a) Interpret the physical architecture and deployment in 5G communication.	13	K2	CO2
OR			
b) Illustrate a channel Propagation in millimeter wave communication and hardware technologies used for mmW Systems.	13	K2	CO2
13. a) Illustrate the Radio Access for Dense Deployments.	13	K2	CO4
OR			
b) Outline about the solutions for practical challenges in Filter-bank based multi-carrier.	13	K2	CO4

14. a) Classify in detail the Single-user MIMO and Multi-user MIMO in MIMO LTE system. 13 K2 CO5

OR

b) Interpret the Capacity of Massive MIMO and Pilot Design of Massive MIMO. 13 K2 CO5

15. a) Outline the need of visible light communication for 6G communication systems. 13 K2 CO6

OR

b) Summarize the evolution toward 6G with different key performance indicators and key enabler technologies. 13 K2 CO6

PART - C (1 × 15 = 15 Marks)

16. a) Interpret the Sparse code multiple access (SCMA) techniques with its block diagram. 15 K2 CO3

OR

b) Explain in detail about the Universal filtered OFDM using Filter-bank based multi-carrier method. 15 K2 CO3