Reg. No.															

Question Paper Code	13551

B.E. / B.Tech. - DEGREE EXAMINATIONS, APRIL / MAY 2025

Sixth Semester

Computer Science and Business Systems

20CBEL614 - MOBILE COMPUTING

Regulations - 2020

Duration: 3 Hours | Max. Marks: 100

PART - A (MCQ) (10 × 1 = 10 Marks)

Answer ALL Questions

		Marks	K – Level	CO
1.	Which of the following is a commonly used path loss model? (a) Okumura-Hata model (b) Newton's model (c) Maxwell's model (d) Faraday's model	1	K1	CO1
2.	What is the primary advantage of 4G over 3G? (a) Higher data speeds and lower latency (b) Improved analog call quality (c) Increased frequency reuse (d) Support for voice calls only	1	K1	CO1
3.	Activity-Based Mobility Model is commonly used in: (a) Urban area simulations (b) Rural environment modeling (c) Fluid mechanics applications (d) Underwater communication	1	K1	CO2
4.	Which of the following is not a factor affecting handoff? (a) Signal strength (b) User speed (c) Data packet size (d) Network traffic	1	K1	CO2
5.	What is the main advantage of using MIMO (Multiple Input Multiple Output) systems? (a) Increased power efficiency (b) Higher data rates and improved reliability (c) Reduced bandwidth usage (d) Simpler receiver design	1	K1	CO3
6.	What does the channel capacity in MIMO systems depend on? (a) Number of antennas (b) Signal-to-noise ratio (SNR) (c) Channel conditions (d) All of the above	1	K1	CO3
7.	Which topology best describes WSNs? (a) Star (b) Mesh (c) Ring (d) Bus	1	K1	CO4
8.	What component in a sensor node consumes the most energy? (a) Sensor (b) Transceiver (c) Processor (d) Battery	1	K1	CO4
9.	Which sensing method does not require cooperation between users? (a) Indirect sensing (b) Cooperative sensing (c) Non-cooperative sensing (d) Distributed sensing	1	K1	CO5
10.	A major challenge in dynamic spectrum access is: (a) Noise filtering (b) Interference management (c) High power (d) Signal compression	1	K1	CO5

PART - B (12 × 2 = 24 Marks)

Answer ALL Questions

		Marks	K – Level	CO
11.	How does cell splitting improve network coverage in urban areas?	2	K1	CO1
12.	Define path loss models in wireless communication.	2	K1	CO1
13.	What are the challenges of channel interference in wireless communication?	2	K1	CO1
14.	Compare Simultaneous Paging and Sequential Paging in mobile networks.	2	K2	CO2
15.	Compare and contrast Static and Dynamic Location Management Schemes.	2	K2	CO2
16.	What are the major factors affecting handoffs in mobile communication?	2	K1	CO2
17.	Define Channel Capacity in the context of MIMO systems.	2	K1	CO3
18.	What is Diversity Gain in MIMO systems, and why is it important?	2	K1	CO3
19.	What is the basic architecture of a sensor node?	2	K1	CO4
20.	Compare MANET and WSN.	2	K2	CO4

21.	Define spectrum sharing.		*2*	*K1*	*CO5*
22.	Compare fixed and dynamic spectrum access.		*2*	*K2*	*CO5*

PART - C (6 × 11 = 66 Marks)

Answer ALL Questions

23.	a)	Explain the concept of cellular architecture in mobile networks and identify its components.	*11*	*K2*	*CO1*
		OR			
	b)	Illustrate the role of cell splitting in enhancing network performance and capacity.	*11*	*K2*	*CO1*
24.	a)	Explain different handoff strategies and compare Soft Handoff and Hard Handoff with their respective advantages and disadvantages.	*11*	*K2*	*CO2*
		OR			
	b)	Relate Static and Dynamic Location Management Schemes in mobile communication networks. Compare their advantages and disadvantages.	*11*	*K2*	*CO2*
25.	a)	Interpret Bluetooth technology and its applications in wireless communication.	*11*	*K2*	*CO3*
		OR			
	b)	Explain Direct Sequence Spread Spectrum (DSSS) and Frequency Hopping Spread Spectrum (FHSS) with examples.	*11*	*K2*	*CO3*
26.	a)	Identify the impact of sensor placement and energy consumption on WSN performance.	*11*	*K3*	*CO4*
		OR			
	b)	Identify the issues of coverage and connectivity in WSNs.	*11*	*K3*	*CO4*
27.	a)	Explain fixed and dynamic spectrum access in detail.	*11*	*K2*	*CO5*
		OR			
	b)	Explain interoperability and coexistence issues in CRNs.	*11*	*K2*	*CO5*
28.	a) (i)	Illustrate the energy-efficient routing using LEACH.	*6*	*K2*	*CO4*
	(ii)	Compare direct and indirect spectrum sensing techniques.	*5*	*K2*	*CO5*
		OR			
	b) (i)	Illustrate the clustering concept in WSNs.	*6*	*K2*	*CO4*
	(ii)	Explain the role of CRNs in enhancing wireless spectrum efficiency.	*5*	*K2*	*CO5*