

Reg.No.:



VIVEKANANDHA COLLEGE OF ENGINEERING FOR WOMEN
[AUTONOMOUS INSTITUTION AFFILIATED TO ANNA UNIVERSITY, CHENNAI]
Elayampalayam – 637 205, Tiruchengode, Namakkal Dt., Tamil Nadu.

Question Paper Code: 7008

B.E. / B.Tech. DEGREE END-SEMESTER EXAMINATIONS – MAY / JUNE 2024

Sixth Semester

Electronics and Communication Engineering

U19ECV32 – MOBILE COMMUNICATION

(Regulation 2019)

Time: Three Hours

Maximum: 100 Marks

Answer ALL the questions

Knowledge Levels (KL)	K1 – Remembering	K3 – Applying	K5 - Evaluating
	K2 – Understanding	K4 – Analyzing	K6 - Creating

PART – A

(10 x 2 = 20 Marks)

Q.No.	Questions	Marks	KL	CO
1.	Interpret the geometry of cellular cell in mobile communication.	2	K2	CO1
2.	Define the co-channel interference. Also, mention the different types of cells in hierarchical order.	2	K1	CO1
3.	What is mean by multipath propagation?	2	K1	CO2
4.	Sketch the block diagram of rake receiver.	2	K1	CO2
5.	Compare frequency division multiple access (FDMA) and time division multiple access (TDMA).	2	K2	CO3
6.	Outline the advantages and disadvantages of space division multiple access (SDMA).	2	K2	CO3
7.	Compare LTE, 4G with 5G.	2	K2	CO4
8.	Define primary user and secondary user in cognitive radio network.	2	K2	CO4
9.	Outline the significances of millimetre (mm) wave. List its advantages and disadvantages.	2	K2	CO5
10.	Outline the significances of using Intelligent Reflecting Surface (IRS).	2	K2	CO5

PART – B

(5 x 13 = 65 Marks)

Q.No.	Questions	Marks	KL	CO
11. a)	i. Explain two ray point to point propagation model.	8	K5	CO1
	ii. Calculate the free-space path loss for a signal transmitted at a frequency of 900 MHz, the distance between transmitter and receiver being 1 km.	5	K2	
(OR)				
b)	i. Illustrate the cellular frequency reuse concept with diagram.	5	K5	CO1
	ii. Explain the handoff mechanism and its significances in mobile communication.	8	K2	
12. a)	Explain Rayleigh and Rician fading distribution.	13	K2	CO2
(OR)				
b)	Explain the linear and non-linear equalizers.	13	K2	CO2
13. a)	Explain code division multiple access (CDMA). Explain its necessity in mobile communication.	13	K2	CO3
(OR)				
b)	Summarize the different packet radio protocols and also explain capture effect in packet radio.	13	K2	CO3
14. a)	i. Explain the evolution of 5G technology.	7	K2	CO4
	ii. Outline the 10 pillars of 5G.	6	K2	
(OR)				
b)	i. Explain cognitive radio technology in 5G wireless communication.	7	K2	CO4
	ii. Summarize air interfacing mechanism in 5G internet.	6	K2	
15. a)	Analyze the challenges in channel modeling, channel estimation and beam forming in wireless communication.	13	K4	CO5
(OR)				
b)	Discuss about MIMO system and necessity of extremely large aperture massive MIMO in future wireless communication.	13	K4	CO5

PART – C

(1 x 15 = 15 Marks)

Q.No.	Questions	Marks	KL	CO
16. a)	i. Assume a cellular system of 32 cells with a cell radius of 1.6 km, a total spectrum allocation that supports 336 traffic channels, and a reuse pattern of 7. Determine the total service area covered with this configuration, the number of channels per cells, and a total system capacity. Assume regular hexagonal cellular topology.	10	K5	CO1
	ii. Let the cell size be reduced to the extent that the same area as covered in a) i with 128 cells. Find the radius of the new cell, and new system capacity.	5	K2	CO1
(OR)				
b)	Explain briefly selection diversity technique. Derive the expression for outage probability and bit error rate.	15	K4	CO2