Code No:**R1642041** **R16** **Set No. 1**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1. a) What is Cell splitting and explain [2]
   b) What is co-channel interference? [3]
   c) What is borrowing channel allocation in mobile communication? [2]
   d) List out the types of antennas used at cell site [2]
   e) Explain the concept of intersystem handoff [3]
   f) Write the features of CDMA [2]

PART–B *(4x14 = 56 Marks)*

2. a) Explain the basic cellular system with neat diagram [7]
   b) The 2G GSM has 125 channels in the uplink and 125 channels in the down link. Each channel has a bandwidth of 200 kHz. What is the total bandwidth occupied in both uplink and down link [7]

3. a) Describe about desired C/I from a normal case in an omni-directional antenna system [7]
   b) What are the different types of non-co-channel interference? Explain [7]

4. a) Compare fixed channel assignment and non–fixed channel assignment? [7]
   b) What are the various techniques used by cellular communication system to improve coverage and capacity in cellular systems? [7]

5. a) How interference can be reduced by using the directional antennas at cell site. [7]
   b) Write the short notes on spaced diversity antennas. [7]

6. a) What are the various handoff strategies based on algorithms of handoff? Explain in detail. [7]
   b) What are the different vehicle locating methods? Explain in detail [7]

7. a) What are the different types of channels for GSM? Explain. [7]
   b) Explain the basic architecture of 3G cellular system with a neat sketch [7]

Code No:**R1642041** **R16** **Set No. 2**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A *(14 Marks)*

1.	a)	Write the differences between macro and micro cellular structures?	[2]
	b)	Write the different types of non-co-channel interference.	[3]
	c)	What is the importance of frequency management chart?	[2]
	d)	Write the features of umbrella pattern antennas	[2]
	e)	Define the dropped call rate	[3]
	f)	List out few comparisons of TDMA and CDMA	[2]

PART–B *(4x14 = 56 Marks)*

2.	a)	Explain the performance of cellular mobile system	[7]
	b)	Write short notes on mobile fading characteristics.	[7]
3.	a)	Explain how co-channel interference is measured in real time mobile radio transceivers	[7]
	b)	What is the purpose of cell sectoring? Explain how co-channel interference in a cellular system may be reduced?	[7]
4.	a)	Explain the phase difference between a direct path and a ground-reflected path.	[7]
	b)	Briefly explain the effects due to human made structures.	[7]
5.	a)	Explain space diversity antennas used at cell site	[7]
	b)	Describe the effects of cell site antenna heights and signal coverage cells	[7]
6.	a)	What are the different types of handoffs? Explain how to implement them	[7]
	b)	Plot the signal strength for a two level handoff scheme and explain it.	[7]
7.	a)	Explain in detail the architecture of 3G cellular systems with neat diagram.	[7]
	b)	Describe the basic principle and advantages of TDMA.	[7]

Code No:**R1642041** **R16** **Set No. 3**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A*(14 Marks)*

1. a) List the main features of 3G cellular systems [2]
   b) Define co-channel interference reduction factor [3]
   c) Describe the concept of overlaid cell [2]
   d) Write the features of Omni directional antennas? [2]
   e) Define the dropped call rate. [3]
   f) Compare the basic technological differences between GSM and CDMA [2]

PART–B*(4x14 = 56 Marks)*

2. a) Describe the analog and digital cellular systems and limitations of AMPS standard [7]
   b) Why does the mobile phone cell, the basic geographic unit of cellular system, have a hexagonal shape? Explain [7]

3. a) Define co-channel interference. How is it measured at the mobile unit and cell site? [7]
   b) Write a brief note on designing directional antenna system considering the effect of interference [7]

4. a) Describe the effect of antenna height in near and long distance mobile propagation. [7]
   b) Explain the mobile radio propagation over water and flat open area and write the general expression [7]

5. a) Explain the construction & Working principal of broadband umbrella pattern antennas in cellular systems [7]
   b) Explain omni directional antenna in detail with neat diagram. [7]

6. a) With a neat diagram explain intersystem handoff in detail [7]
   b) Explain the difference between soft handoff and hard handoff [7]

7. a) What are the advantages of digital cellular systems over analog? [7]
   b) Describe the principle, advantages and disadvantages of CDMA technique [7]

Code No:**R1642041** **R16** **Set No. 4**

IV B.Tech II Semester Regular/Supplementary Examinations, June - 2022

CELLULAR AND MOBILE COMMUNICATIONS

(Electronics and Communication Engineering)

Time: 3 hours **Max. Marks: 70**

Question paper consists of Part-A and Part-B
Answer ALL sub questions from Part-A
Answer any FOUR questions from Part-B

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PART–A*(14 Marks)*

1. a) Explain the concept of Cell sectoring. [2]
   b) What are the types of interferences in cellular system? [3]
   c) Explain the concept of paging channels in detail. [2]
   d) List out the types of antennas used at cell site. [2]
   e) List out the different vehicle locating methods. [3]
   f) Write the features of OFDMA. [2]

PART–B*(4x14 = 56 Marks)*

2. a) Explain the concept of frequency reuse channels and frequency reuse distance. [7]
   b) Why do all cells not have uniform size in a practical cellular network? Explain. [7]

3. a) What is Interference and determine the real time co-channel interference in cellular systems. [7]
   b) What is titling antenna? How can these antenna patterns reduce the co-channel interference? [7]

4. a) Describe the form of a point-to-point model and explain its types [7]
   b) Explain the mobile signal propagation over water and flat area. [7]

5. a) What are the different types of antennas used at cell site? Explain them in detail. [7]
   b) Define space diversity technique and explain horizontally and vertically oriented space diversity antennas [7]

6. a) What is meant by handoff? Describe the classification of handoff processes. [7]
   b) What is meant by handoff initiation? Explain the different methods of handoff initiation with suitable diagrams. [7]

7. a) Elaborate the concept of GSM channels in digital cellular networks. [7]
   b) Draw the TDMA frame structure and explain the significance of each slot. [7]