Code No: 127BG **R15**

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year I Semester Examinations, January/February - 2023
CELLULAR AND MOBILE COMMUNICATIONS
(Electronics and Communication Engineering)

Time: 3 Hours **Max. Marks: 75**

Note: i) Question paper consists of Part A, Part B.
ii) Part A is compulsory, which carries 25 marks. In Part A, Answer all questions.
iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

PART – A

(25 Marks)

1.a)	Mention the limitations of conventional mobile telephone systems.	[2]
b)	Discuss the dependence of frequency reuse distance on cell reuse pattern.	[3]
c)	What are the various types of non-cochannel interference?	[2]
d)	Mention the effect on coverage and interference of mobile link by decrease in transmitted power level.	[3]
e)	What are the advantages of sectorized cells?	[2]
f)	State the factors on which the minimum separation of cell site antennas depends?	[3]
g)	List any three techniques for increasing frequency spectrum utilization?	[2]
h)	What is meant by frequency management	[3]
i)	Explain the concept of delaying handoff in brief.	[2]
j)	Define intersystem hand off?	[3]

PART – B

(50 Marks)

2.a) Explain the operation of a Cellular system with neat diagram?
b) Derive C/I from a normal case in a omnidirectional antenna system. [5+5]

OR

3.a) Distinguish between signal and co-channel interference received by the mobile unit and cell site?
b) Mention the two frequency reuse schemes and explain N-Cell reuse pattern in detail for four and seven cell reuse with illustrative diagrams. [5+5]

4.a) Discuss the effects of antenna parameters on the cell interference?
b) With neat sketch, explain how directional antennas achieve reduction in interference?[5+5]

OR

5.a) Write short notes on: i) space diversity ii) Time diversity.
b) Describe the effect of antenna height in near and long distance mobile propagation.[6+4]

6.a) Explain in detail about long-distance propagation?

b) With neat sketch explain about Signal reflections in flat and hilly terrain. [5+5]

OR

7.a) Explain the propagation of mobile signals over water and flat open area with general formula.

b) Explain the effect of the human made structure on cell coverage. [5+5]

8.a) What do you understand by non-fixed channel assignment? Describe the corresponding algorithms?

b) Discuss the concept of frequency management concern to the numbering the channels and grouping into the subset. [5+5]

OR

9.a) What are the different techniques to utilize the frequency spectrum, give a brief explanation?

b) Differentiate between fixed and non-fixed channel assignment in detail. [5+5]

10.a) Write short notes on the following:
i) Cell splitting ii) Vehicle locating methods iii) Dropped cell rate.

b) What are the various handoff initiation techniques? Explain any one. [5+5]

OR

11. Explain the following Handoffs:
a) Mobile Assisted b) Soft c) Delaying d) Cellsite e) Forced. [10]

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