

**R15**

**Code No: 127BG**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech IV Year I Semester Examinations, December-2023/January-2024**

**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) Explain real time Co- Channel interference. [2]
- b) What are the various techniques used to enhance the capacity of cellular systems? [3]
- c) Define cross talk. [2]
- d) What is Co-channel Interference Reduction Factor? [3]
- e) Why there is a constant standard deviation along the path loss curve? [2]
- f) What is meant by foliage? Define foliage loss? [3]
- g) What are the advantages of sectorized cells? [2]
- h) Explain about paging channels. [3]
- i) Define Handoff. What are the different types of handoffs? [2]
- j) Define intersystem hand off. [3]

**PART – B**

**(50 Marks)**

- 2.a) Explain the steps involved in planning a cellular system. Illustrate how the performance criterion is evaluated.
- b) What are the limitations of conventional mobile telephone system? [5+5]

**OR**

- 3.a) Discuss various techniques used to increase the capacity of a cellular system.
- b) Distinguish between permanent splitting and dynamic splitting. [6+4]
- 4.a) Explain the effects of Antenna parameters in designing cellular system.
- b) Explain how the interference is reduced by means of directional antennas. [5+5]

**OR**

- 5.a) Discuss the coverage of cell site using Omni directional antennas.
- b) Explain the near field and far field interference and how to avoid it. [5+5]

- 6.a) Explain the effect of propagation of mobile signals over water.
- b) Explain ground incident angle, elevation angle, ground reflection and reflection point with respect to signal coverage. [5+5]

**OR**

- 7.a) Explain about Umbrella pattern antennas.
- b) What are the limits of the model? Explain it. [5+5]

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- 8.a) Compare omni and sectorized cells for seven cell system in fixed channel assignment.  
b) What do you understand by non-fixed channel assignment? Describe the corresponding algorithms. [5+5]

**OR**

- 9.a) Explain how 'grouping' of channels is achieved.  
b) Explain what are the different channel assignment techniques at cell sites? [5+5]

- 10.a) Explain two-hand-off-level algorithms  
b) What are the different factors that limit the size of splitting cells? [5+5]

**OR**

- 11.a) Define the dropped call rate and obtain the expression for it.  
b) Explain cell splitting and its effect on the performance of cellular systems. [5+5]

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