

Code: 20EC4702A

IV B.Tech - I Semester – Regular Examinations - DECEMBER 2023

**CELLULAR AND MOBILE COMMUNICATIONS
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Max. Marks: 70

Note: 1. This paper contains questions from 5 units of Syllabus. Each unit carries 14 marks and have an internal choice of Questions.

2. All parts of Question must be answered in one place.

BL – Blooms Level

CO – Course Outcome

| | | | BL | CO | Max. Marks |
|----------------|----|--|----|-----|------------|
| UNIT-I | | | | | |
| 1 | a) | Explain analog cellular architecture and components with necessary block diagram? | L2 | CO1 | 7 M |
| | b) | Explain the concept of “FREQUENCY REUSE” as applied to Cellular Communications. What are the advantages of this approach? | L2 | CO1 | 7 M |
| OR | | | | | |
| 2 | a) | Describe the operation of cellular system. | L2 | CO1 | 7 M |
| | b) | Derive an expression relating the Co-channel interference Reduction Factor with the Carrier to Interference Ratio for a cellular system? | L3 | CO1 | 7 M |
| UNIT-II | | | | | |
| 3 | a) | Explain the long distance propagation in Near-in distance? | L2 | CO2 | 7 M |

| | | | | | |
|-----------------|----|---|----|-----|-----|
| | b) | Describe the effects of human made structures for mobile propagation in open area. | L2 | CO2 | 7 M |
| OR | | | | | |
| 4 | a) | Derive an expression for the phase difference between direct path and the ground reflected path. | L3 | CO2 | 7 M |
| | b) | Write the formula and explain for mobile propagation Land -to mobile over water. | L2 | CO2 | 7 M |
| UNIT-III | | | | | |
| 5 | a) | Describe umbrella pattern antennas for cell site coverage. | L2 | CO3 | 7 M |
| | b) | Write short notes on setup, access and paging channel assignments to cell sites and mobile units? | L1 | CO3 | 7 M |
| OR | | | | | |
| 6 | a) | Explain Omni directional antennas for interference reduction at cell site. | L2 | CO3 | 7 M |
| | b) | What are the various Non-fixed channel assignment strategies with respect to cell sites and explain them? | L2 | CO1 | 7 M |
| UNIT-IV | | | | | |
| 7 | a) | What type of handoff is used when a call initiated in one cellular system and enters into another system before terminating a call? Explain how it works. | L2 | CO3 | 7 M |
| | b) | What is dropped call rate? Explain how it is evaluated. | L2 | CO1 | 7 M |

| OR | | | | | |
|---------------|----|--|----|-----|-----|
| 8 | a) | What are the various handoff techniques? Explain. | L2 | CO3 | 7 M |
| | b) | What are the merits and demerits of delaying handoff? With a neat sketch explain two level delaying handoff. | L2 | CO3 | 7 M |
| UNIT-V | | | | | |
| 9 | a) | Explain principle, advantages and disadvantages of 4G over 3G technique. | L2 | CO4 | 7 M |
| | b) | What are the various subsystems in GSM architecture? Explain the network switching subsystem. | L2 | CO4 | 7 M |
| OR | | | | | |
| 10 | a) | Write limitations of 4G and 5G evolution. | L1 | CO4 | 7 M |
| | b) | Explain basic architecture of GSM radio sub system with a neat diagram. | L2 | CO4 | 7 M |