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Total Number of Pages: 02

Course: B.Tech
Sub_Code: REC7D007

7th Semester Regular/Back Examination: 2024-25

SUBJECT: MOBILE COMMUNICATION

BRANCH(S): AEIE, EIE

Time: 3 Hours

Max Marks: 100

Q.Code: R202

Answer Question No.1 (Part-1) which is compulsory, any eight from Part-II and any two from Part-III.

The figures in the right-hand margin indicate marks.

Part-I

Q1 Answer the following questions: (2 x 10)

- What is cell splitting concept in cellular system?
- Define Traffic Intensity and Grade of Service.
- Which important modulation technique is used in mobile communication?
- Which cell geometry in cellular system is used?
- What is co-channel interference?
- What is frequency reuse factor?
- In a cell with 200 mobile stations, on an average 20 requests are generated during an hour with average holding time 300 sec. Find out the offered load?
- What are the necessary steps required to remove the ISI in a wireless communication channel?
- Define FDMA.
- What is the processing gain in Spread Spectrum technique?

Part-II

Q2 Only Focused-Short Answer Type Questions- (Answer Any Eight out of Twelve) (6 x 8)

- Discuss about cell geometry structure & cell splitting concept.
- Write the Channel assignment strategies?
- What are the Propagation Path-Loss Models in wireless communications? Explain any one of them.
- Discuss Co-channel Interference & Co-channel Interference Ratio.
- Consider a transmitter which radiates a sinusoidal carrier frequency of 950 MHz. For a vehicle moving 60 km/Hr, compute the received carrier frequency if the mobile is moving in 120° to the direction of arrival of transmitted signal.
- Explain attenuation & signal fading in wireless communications.
- What is SIR, derive it for a worst-case scenario of cellular mobile communication system for $N = 7$, what are the techniques to improve its value?
- How a telephone call can be established in a cellular communication system, explain with neat diagrams.
- Explain QPSK transmission & draw its constellation diagram.

- j) Explain the basic principles of CDMA.
- k) Explain equalization technique & how it is important in spread spectrum?
- l) Discuss the necessity of spread spectrum technique in mobile communication.

Part-III

Only Long Answer Type Questions (Answer Any Two out of Four)

- Q3** a) Discuss Adjacent Channel Interference and write its remedy. **(8+8)**
b) Discuss the key features of various generation of wireless communication systems.
- Q4** a) Explain QAM modulator & its demodulator. **(8+8)**
b) What is the Doppler's effect on mobile communication? What is the Jakes Spectrum? Explain.
- Q5** Explain TDMA with neat structure. Write its applications & compare it with FDMA. **(16)**
- Q6** What is the concept of Spread Spectrum? Illustrate the Frequency-Hopping Spread spectrum with required block diagram & write its few applications. **(16)**