

May 2024

B.Tech. (RAI) (Sixth Semester)
Mobile Communication Network
(PEC-RAI-611-21)

Time : 3 Hours]

[Maximum Marks : 75

Note : It is compulsory to answer all the questions (1.5 marks each) of Part A in short. Answer any *four* questions from Part B in detail. Different sub-parts of a question are to be attempted adjacent to each other. :

Part A

1. (a) What do you mean by Cell in Mobile Communication ? **1.5**
- (b) What do you understand by MSC ? **1.5**
- (c) What is the significance of propagation model ? **1.5**
- (d) Define Doppler shift. **1.5**
- (e) What do you mean by forward and reverse channel ? **1.5**

- (f) What do you mean by dwell time ? 1.5
- (g) How can we improve the performance of digital modulation under fading channels ? 1.5
- (h) What are the techniques used to improve the received signal quality ? 1.5
- (i) Differentiate linear and non-linear equalizer. 1.5
- (j) What do you mean by EDGE in wireless communication ? 1.5

Part B

- 2. (a) Explain in detail the 1G, 2G, 3G generation systems and their standards. 7.5
- (b) How do you improve the coverage and capacity of a cellular system ? 7.5
- 3. (a) Explain the scattering process with radar cross-section model. 7.5
- (b) Explain the term fading. What are the factors influencing small scale fading ? 7.5
- 4. (a) Explain code division multiple access technique. And also compare with TDMA and FDMA. 7.5

- (b) Draw the signal space representation of QPSK and BPSK signals. Show that for the same data rate and same bit energy, they have same bit error rate probability on the same AWGN channel. Although one of the signals occupy half the bandwidth. 7.5
- 5. (a) What do you mean by Diversity ? Explain the Polarization Diversity. 7.5
- (b) What do you mean Equalizer ? Explain the Zero force equalizer. 7.5
- 6. (a) What do you mean by network switching subsystem and network management system in GSM ? Draw and explain each unit. 7.5
- (b) What do you mean by GPRS ? Draw and explain its architecture. 7.5
- 7. (a) What do you mean by hand off ? Which hand off technology is used in GSM and CDMA ? Explain. 7.5
- (b) What do you mean by Cellular system ? How will it be operated ? 7.5