Registration No.: | | | | | | | | | | |

Total Number of Pages: 02

Course: B.Tech
Sub_Code: REC7D007

7th Semester Regular Examination: Nov2025
SUBJECT: MOBILE COMMUNICATION
BRANCH(S): AEIE
Time: 3 Hours
Max Marks: 100
Q.Code : U098

Answer Q1 (Part-I) 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)**

a) Write special features of 4G system.
b) If the received power P_r = 12W, G_t = 0.8 dB, G_r = 1dB, and f_c = 900 MHz, find out the transmitted power P_t.
c) What is signal fading?
d) Define signal fading concept in mobile communication.
e) What is the co-channel interference? How do you relate the co-channel reuse ratio with the cluster size?
f) What is frequency reuse factor? What is its importance?
g) In a cell with 50 mobile stations, on an average 12 requests are generated during an hour with average holding time 360 sec. Find out the offered load?
h) Write about segmentation concept.
i) What is Multiple Access Technique?
j) 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)**

a) What is attenuation over Reflecting Surfaces? How does it affect the performance?
b) Write the Channel assignment strategies.
c) What is co-channel interference and derive the signal to interference ratio in a cellular environment.
d) Explain about two ray ground reflection models.
e) How Cellular Communication get established, explain.
f) Why hexagonal cell geometry cellular system is required, explain.
g) Consider the advanced mobile phone system in which an S/I ratio of 18 dB is required for the accepted voice quality. What should be the reuse factor for the system? (Assume Path loss exponent = 4).
h) Explain Frequency-Hopping Spread Spectrum.

i) A spectrum of 80 MHz is allocated to a wireless FDD cellular system, which uses two 40 KHz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses (I) four-cell reuse, (II) 12-cell reuse. If 1.2 MHz of the allocated spectrum is dedicated to control channels, determine an equitable distribution of control channels and voice channels in each cell for each of the three systems?

j) Explain CDMA technique.

k) Explain QPSK modulation for mobile communication.

l) Explain equalization technique. How it is important in spread spectrum?

Part-III

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

Q3 a) Explain various Propagation Path-loss Models briefly. **(8)**

b) Write in detail about the key features of (1G, 2G, 3G, 3.5G, 4G) of wireless communication systems. **(8)**

Q4 a) Describe Quadrature Amplitude Modulation with its transmitter & receiver system. **(8)**

b) Explain Adjacent Channel Interferences with its types. **(8)**

Q5 Explain TDMA technique in mobile communication. Give comparison report by comparing it with FDMA. Also mention their practical uses. **(16)**

Q6 Explain the requirement of spread spectrum techniques in mobile communication system. Also explain the transmission and reception process for Direct-Sequence Spread Spectrum using block diagram. **(16)**