Registration no: | | | | | | | | | | |

Total Number of Pages: 02 **B.Tech**

PEEC5302

6th Semester Regular / Back Examination 2016-17
MOBILE COMMUNICATION
BRANCH: ECE, ETC
Time: 3 Hours
Max Marks: 70
Q.CODE: Z885

Answer Question No.1 which is compulsory and any five from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:** **(2 x 10)**

a) Write the advantages of TDMA over FDMA system?
b) What are the advantages of Cell Sectoring?
c) What is Frequency Reuse?
d) Prove $D=\sqrt{3}NR$?
e) Define Reflection, Diffraction and Scattering?
f) Differentiate between Fast Fading and Slow Fading?
g) How do you define Grade of Service of a Cellular System?
h) What is the role of an equalizer in a receiver of a wireless communication system?
i) In US, AMPS 416 channels are allocated to various cellular operators. The channel between them is of 30KHz with guard band of 10KHz.Calculate the spectrum allocation given to each operator?
j) What is meant by spread spectrum multiple access?

Q2 **a)** Calculate the Signal to Interference Ratio for the Co-Channel Cells? **(2)**
b) If a signal to interference ratio of 15dB is required for satisfactory forward channel performance of a cellular system, what is the cluster size that should be used for maximum capacity, if the path loss exponent is (a)$\gamma=4$ (b) $\gamma=3$ **(8)**

Q3 **a)** With neat diagram explain the TDMA frame structure? **(5)**
b) If a GSM system uses a frame structure where each frame consists of 8 time slots, and each time slot contains 156.25 bits, and data is transmitted at 270.833 kbps in the channel, find **(5)**

(a)the time duration of a bit

(b)the time duration of a slot

(c)the time duration of a frame

(d)How long must a user occupying a single time slot wait between two successive transmissions?

Q4 **a)** Explain the function of Frequency Hopping Spread Spectrum Systems? **(5)**

b) In a FHSS system, a hopping B.W of 100MHz and a frequency spacing of 10KHz is used. What is the minimum number of PN chips that are required for each frequency symbol? **(5)**

Q5 **a)** Briefly describe the physical factors in the radio propagation channel that influence small scale fading? **(5)**

b) What are the disadvantages of QPSK? Explain with proper diagram? **(5)**

Q6 **a)** Prove that for a hexagonal geometry, the co-channel reuse ratio is given by $Q = \sqrt{3N}$, where $N = i^2 + ij + j^2$, using cosine law and the hexagonal cell geometry? **(5)**

b) Explain the concept of frequency reuse in mobile communication? **(5)**

Q7 With neat diagram explain the Ground Reflection (Two Ray) Model? **(10)**

Q8 **Write short answer on any TWO:** **(5 x 2)**

a) DSSS

b) Binary Phase Shift Keying

c) Quadrature Amplitude Modulation

d) FDMA System