2nd Sem Regular / Back Examination – 2015-16
WIRELESS COMMUNICATION
Q.CODE: W764
Time: 3 Hours
Max marks: 70

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)   Mention the concept and significance of frequency reuse and important parameters to characterize this in wireless communication.
   b)   What do you understand by umbrella shape approach technique in cellular communication?
   c)   Explain the concept of cell splitting and cell sectoring.
   d)   What is role of S/I ratio in the design of a cell cluster?
   e)   Write down the difference between outdoor and indoor propagation models.
   f)   Illustrate in brief the scenario of handoff strategies through an appropriate sketch.
   g)   State the features and characteristics of DECT.
   h)   Mention the components present in PACS system architecture.
   i)   List out some applications of WLAN.
   j)   What are the classifications made in the perspective of GPRS equipments.

Q2 a)   Describe the significance of small scale multipath measurements. How they are   classified?   (5)
         Mention about one type of channel sounding technique.

    b)   If a signal-to-interference ratio of 15 is required for satisfactory forward channel performance of   (5)
         a cellular system, what is the frequency reuse factor and cluster size that should be used for
         maximum capacity if the path loss exponent is (i) n=4, (ii) n=3 ? Assume that there are six co-
         channel cells in the first tier, and all of them are at the same distance from the mobile. Suitable
         approximations may be used for the purpose.

Q3 a)   Mention in brief the basic propagation mechanisms..   (5)

    b)   Explain in detail the factors in the radio propagation channel that influence small scale fading.   (5)

Q4   What do mean by diversity technique? With a neat sketch of space diversity scheme, mention   (10)
         the different kinds of reception methods in brief.
         Assume for branch diversity is used, where each branch receives an independent Rayleigh
         fading signal. If the average SNR is 20 dB, determine the probability that the SNR will drop
         below 10 dB. Compare this with the case of a single receiver without diversity.

Q5 a)   Mention the relevance and advantages of nonlinear equalizers over linear equalizers. What are   (5)
         the effective methods developed in most 2G and 3G systems? Also describe the theory behind
         maximum likelihood sequence estimation equalizer in brief.

b) Justify the necessity of developing algorithms for adaptive equalization. Discuss how the performance of an algorithm is determined. (5)

Q6 a) State the reasons and justify, why CSMA/CD not suitable for wireless networks? 09(5)

b) Describe the basic WLAN architecture and its related components. (5)

Q7 a) Illustrate the concepts of spread spectrum techniques. Discuss about the performance of frequency hopping spread spectrum with a neat block diagram. (5)

b) Describe the multiple access techniques those are grouped under narrow band and wideband systems. Mention about TDMA scheme with appropriate figure. (5)

Q8 Write short notes on any two: (5 x 2)
a) Rake receiver
b) UMTS
c) Doppler Shift
d) ALOHA