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22158

M.E. 3rd Semester ECE

Examination–May, 2014

CDMA SYSTEM

Paper-MEEC-603

Time : 3 hours ***Max. Marks : 100***

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard will be entertained after the examination.

Note : Attempt any **five** questions out of given eight.

1. (a) Why is DSSS preferred over FHSS technique for bursty data transmission? Distinguish between slow and fast FHSS systems. *10*

(b) If PN codes are not orthogonal, is CDMA still possible ? If so, why and if not, why ? *10*

2. (a) List the important 15-95 CDMA air-interface standard specifications. *10*

(b) What is near and far effect in CDMA systems ? In a given cellular system, the distance of a mobile user from the cell-site may range from 100m to 10 km. Given $\gamma=4$, what is expected difference in received power levels at the cell-site if both mobile users transmit at the same power level ? Comment on the results obtained. *10*

3. What is CDMA cell capacity ? Derive an expression for it. For the Shannon limit in additive White Gaussian Noise, calculate the theoretical number of mobile users, M in terms of processing gain in CDMA system. Also compute M for $E_6/N_6 = 6dB$. *20*

4. (a) Enumerate the advantages and disadvantages of CDMA cellular network. *10*

(b) Compare CDMA and GSM. *10*

5. (a) Explain the structure and use of long and short PN codes. *10*

(b) What is the advantage of unslotted mode of paging over slotted mode. *5*

(c) Explain what is padding. Where and why it is used ? *5*

6. Draw and explain the basic reference model of 15-95 (uplink and downlink). Also explain the basis of implementing soft hand off in CDMA systems ? *20*

7. (a) Differentiate between hard, soft and softer hand off. *10*

(b) What are orthogonal walsh codes ? Where these are used ? *10*

8. (a) A cellular system employs CDMA scheme. Is it possible to use TDMA instead of CDMA ? If not, why not, and if yes what may be the potential advantage ? *10*

(b) Draw and explain the principle of RAKE receiver. Use the block diagram of RAKE receiver. *10*
