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SF-7723

B. E. - IV (Sem. VIII) (E & C) Examination

May / June - 2011

Cellular Mobile Technology

Time : **3** Hours] [Total Marks : **100**

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ B. E. - 4 (SEM. 8) (E & C)

Name of the Subject :

☛ CELLULAR MOBILE TECHNOLOGY

☛ Subject Code No. : 7 7 2 3 ☛ Section No. (1, 2,.....) : NIL

Seat No. :

Student's Signature

(2) All the abbreviations and symbol have their usual meaning.

(3) Assume suitable data wherever found necessary.

(4) Figure on the right indicate full marks.

1 (a) Answer the following questions in brief : **10**

(i) State the benefits of digital cellular systems over its analog counter part.

(ii) Brief about the strategies to reduce adjacent channel interference.

(iii) Why hexagonal geometry is preferred for cell ?

(iv) What are IMSI and TMSI numbers in GSM ? Discuss their role in brief.

(v) List out the information programmed in SIM Card.

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

(c) If Mr. X uses non type approved mobile and originates a call then explain the steps to be executed by GSM network in order to process the request for making call. **5**

2 Attempt the followings:

(a) Discuss in detail about the importance of different components like BSS and NSS of GSM system. 8

(b) Why is there a need of source coding-channel coding combination while signal processing of GSM network ? Why VAD-DTx is used in source coding ? 7

OR

2 Attempt the followings :

(a) Discuss in detail about those registers in GSM which are responsible for maintaining subscription information and temporary mobile station identity numbers of users. 8

(b) While in transit Mr. X switches on his mobile and crossing over from one to other mobile switching center, what information does a network need to store ? Mention the steps required to be executed in the above case for data maintenance and signal processing. 7

3 Attempt any three : 15

(i) Adjacent and co-channel interference

(ii) Forced and Delayed Hand off strategies

(iii) Role of Ciphering and Encryption in GSM

(iv) Protocol model of GSM.

4 (a) Answer the following questions in brief : 10

(i) Discuss : "CDMA system has ideally reuse factor of 1(one) still cellular concept is used in CDMA".

(ii) Explain "coherence time" in context of cellular mobile communication.

(iii) "Cell boundaries are the lines of equal power from the adjacent base stations." Discuss.

(iv) What is the importance of interleaving ? Give the types of errors mitigated by interleaving.

(v) Explain the concept of orthogonal multiplexing in context of wireles mobile communication.

(b) Compare the various multiple access techniques in cellular mobile communication. **5**

(c) What is interference ? What is the need of measuring carrier to interference ratio ? Mention the different types of interference appear in cellular networks. **5**

5 (a) In case of CDMA systems 16 bits are received as 1001011010110110. It is expected that the received sequence is in error. Use following decoding method(s) to detect the correct code transmitted by the system. **8**

(i) Hamming distance

(ii) Walsh decoding method

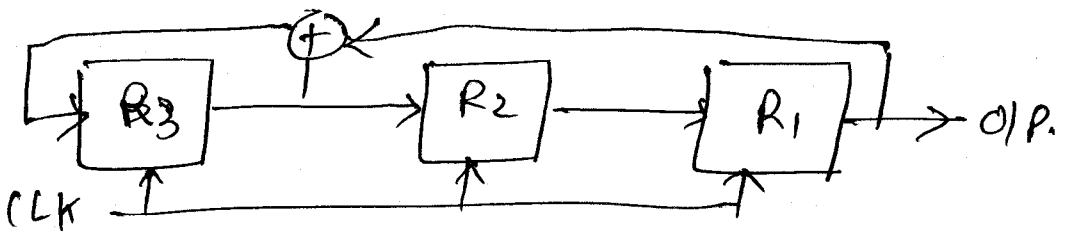
(b) Draw and explain modulation process for IS-95 CDMA system for reverse traffic channel. **7**

OR

5 (a) Draw and explain modulation process for IS-95 CDMA system for forward traffic channel. **7**

(b) (i) What are the practical difficulties at receiver end if it has to detect pure random CDMA signals ? **2**

(ii) Find the output sequence for the following Linear feedback Shift Register. **6**
Take initial seed (R1, R2, R3) =110. Does this result into MLSR sequence ?



6 Write short notes (any three) **15**

(a) Diversity in CDMA

(b) Power Control methods in CDMA

(c) Walsh coding properties and Walsh code generation using proper example.

(d) Synchronization as issue : importance and solution in case of CDMA.
