[5254]-591

B.E. (Electronics) (End Semester)
MOBILE COMMUNICATION
(2012 Pattern)

Time : 2½ Hours]   *[Max. Marks : 70*

Instructions to the candidates:

1) *Attempt Q 1 or Q 2, Q 3 or Q 4, Q 5 or Q 6 and Q 7 or Q 8.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Figures to the right indicate full marks.*
4) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
5) *Assume suitable data, if necessary.*

Q1) a) A hexagonal cell within a 4-cell system, has a radius of 1.387 km. A total of 60 channels are used within the entire system. If the load per user is 0.029 Erlangs, and $\mu = 1$ call/hour, compute the following for Erlang C system for Gos of 5%. **[6]**

   i) How many users per square km will this system support.

   ii) What is the probability that a delayed call will have to wait for more than 10s.

   [Given : traffic intensity = 8.8 Erlangs (C = 15), for C = 20, traffic intensity = 11 Erlangs, C = 40, traffic intensity = 30.1 Erlangs]

   b) Derive the impulse response model for multipath channel. **[7]**

   c) Explain concept of equalization in communication and explain the block diagram of adaptive equalizer at receiver. **[7]**

OR

Q2) a) Explain hand off mechanism in detail and also explain the call dropping conditions. While hand off. **[6]**

   b) A receiver is located 10km from a 50W transmitter. The carrier frequency is 900 MHz, free space propagation is assumed with $G_t = 1$ and $G_r = 2$, find. **[7]**

   i) the magnitude of E-field at the receiver antenna.

   ii) the power at the receiver.

P.T.O.

iii) the rms voltage applied to the receiver input, assuming that the receiver antenna has a purely real impedance of 50Ω and is matched to the receiver.

c) Define diversity and write a note on RAKE receiver. **[7]**

Q3) a) State and explain the criterias for selection of speech codecs for mobile communication. **[8]**

b) Explain the various types of multiple access techniques used in mobile communication and explain SDMA in detail. **[8]**

OR

Q4) a) With neat block diagram explain USDC speech encoder and decoder. **[8]**

b) What are disadvantages of FDMA and TDMA? How these are over come in CDMA? Explain with help of neat diagram **[8]**

Q5) a) Write a note on **[10]**

i) Packet Reservation multiple access Protocol.

ii) Distributed database for mobility management.

b) Explain fixed network transmission Hierarchy. **[6]**

OR

Q6) a) Write a note on **[10]**

i) Common channel signaling.

ii) SS 7 signaling protocol.

b) Draw the cellular packet switched architecture for PCS/PCN. **[6]**

Q7) a) Draw and explain the block diagram GSM system architecture. Also draw the GSM frame structure. **[9]**

b) Draw the logical and physical channels for CDMA 2000 system. **[9]**

OR

Q8) a) Describe the evolution of CDMA 2000 from IS95 and explain the CDMA handoff parameters. **[9]**

b) Compare IS-95 CDMA and CDMA 2000 standard on basis of carrier spacing, chiprate, Modulation types, Frame duration and generation. **[9]**

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