2002 SCHEME

USN | | | | | | | | | | |

EC754

Seventh Semester B.E. Degree Examination, June/July 2011
Wireless Communication

Time: 3 hrs. Max. Marks:100

Note: ***Answer any FIVE full questions.***

1 a. Explain the evolution of PCS with reference to AMPS, DECT and CDMA. **(06 Marks)**

b. With a timing diagram approach, explain how a land-line initiated call is connected to a mobile. **(10 Marks)**

c. What is meant by Common Air Interface (CAI)? Specify the channels and their functions. **(04 Marks)**

2 a. Specify the types of 'prioritising hand-off's'. Explain each of them with practical hand-off considerations. **(06 Marks)**

b. A hexagonal cell with 4 cell system has a radius of 1.4 kms. A total of 80 channels are used within the entire system. If the load per user is 0.03 Erlangs and call rate is 2 calls per hour, compute the following for Erlang-C system with a traffic of 14E.

i) How many users / sq.km will this system support?

ii) What is the probability that a call will be delayed for more than 10 seconds? **(10 Marks)**

c. Differentiate between microcells and repeaters. **(04 Marks)**

3 a. The height of the transmitter antenna is 50 m, the height of the receiver antenna at 12 kms distance is 25 m and a knife edge of height 100 m is at a distance of 10 kms from the transmitter. Find i) the loss due to knife edge in dB. ii) height of the obstacle required to induce 6 dB diffraction loss. Assume frequency of transmission to be 850 MHz. **(10 Marks)**

b. Explain the following with related equations:

i) Critical height of a rough surface for scattering (h_c).

ii) Log normal shadowing.

iii) Fresnel – Kirchoff's parameter (γ) and diffraction gain. **(10 Marks)**

4 a. Explain with related parameters and equations, how the percentage coverage area $U(\gamma)$ is calculated. Draw the related graph for $(\frac{\sigma}{n})$ Vs $U(\gamma)$. **(08 Marks)**

b. What are the types of 'outdoor propogation models'? Enumerate the salient points with reference to 'Longley-Rice' model. **(08 Marks)**

c. Specify the parameters which affect the indoor propagation. Mention the different models. **(04 Marks)**

5 a. Enumerate the effects of small scale fading and the factors that influence the fading. **(06 Marks)**

b. Mention the types of small scale multiple measurements. Explain direct RF pulse system. **(08 Marks)**

c. Differentiate between fast and slow fading based on Doppler spread. **(06 Marks)**

6 a. What is the requirement for pulse shaping when a band-limited channel is used? Explain 'Raised cosine roll-off filter' with related equations and graphs. **(10 Marks)**

b. With related block concept, explain DPSK transmitter and receiver. Illustrate the encoding process. **(10 Marks)**

7 a. What are the characteristics of speech coders? Enumerate. **(06 Marks)**

b. What is meant by vector quantization? Explain the concept of adaptive transform coding with related equations. **(10 Marks)**

c. Differentiate between voiced and unvoiced speech with examples. **(04 Marks)**

8 a. Draw and explain TDMA frame structure. **(08 Marks)**

b. What is the concept of spread spectrum multiple access? Explain FHMA in detail. **(08 Marks)**

c. Differentiate between pure ALOHA and slotted ALOHA. **(04 Marks)**

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