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Paper Code : PE-EC701C Mobile Communication and Networks

UPID : 007710

Time Allotted : 3 Hours

Full Marks : 70

The Figures in the margin indicate full marks.

Candidate are required to give their answers in their own words as far as practicable

Group-A (Very Short Answer Type Question)

1. Answer any ten of the following :

[1 x 10 = 10]

- (i) 2G CDMA standard – cdma one supports up to _____.
- (ii) Space diversity is also known as _____.
- (iii) The minimum spectrum allocation required for W-CDMA is _____.
- (iv) Traffic multiframe consists of _____ frames.
- (v) Which modulation scheme is used by Bluetooth?
- (vi) _____ does not come under subsystem of GSM architecture.
- (vii) Centre excited hexagonal cells use _____ antennas.
- (viii) Commonly used mode for 3G networks is _____.
- (ix) CDMA digital cellular standard is _____.
- (x) What are the types of lists maintained by EIR (Equipment Identification Register)?
- (xi) _____ leads to time dispersion and frequency selective fading.
- (xii) _____ memory device stores information such as subscriber's identification number in GSM.

Group-B (Short Answer Type Question)

Answer any three of the following :

[5 x 3 = 15]

2. Explain the method OFDM. [5]
3. Explain the roles played by VLR, HLR and AUC during call set up. [5]
4. Compare between MSK and GMSK modulation schemes. [5]
5. Explain the concept of Diversity receivers. [5]
6. Consider a single power transmitter that can support 100 voice channels covering a given service area. Let the service area be divided into seven smaller areas (cells), each supported by lower power transmitters. The available spectrum of 100 voice channels is divided into 4 groups of 25 channels each. The cells (1, 7), (2, 4), (3,5) and 6 are assigned distinct channel groups. Calculate the modified system capacity. [5]

Group-C (Long Answer Type Question)

Answer any three of the following :

[15 x 3 = 45]

7. (a) What are the propagation mechanisms of EM waves? [4]
- (b) What do you mean by small scale fading? [4]
- (c) What are the factors influencing small scale fading? [4]
- (d) When does large scale propagation occur? [3]
8. (a) "Every mobile device must be deauthenticated whenever it leaves a cell" – explain. [5]
- (b) Discuss about practical channel assignment strategies. [4]
- (c) Why does 2.5G use both Packet switching and Circuit switching? [4]
- (d) Define co-channel interference. [2]
9. a) Explain Packet Switching and Circuit Switching. []
- b) What is 4G? [3+3+3+3+3]
- c) Why are different coding mechanisms used in 2G and 2.5G? []
- d) How does location update take place in GSM system? []
- e) What is 'Near and Far' problem in CDMA basic system? []
10. (a) What do you mean by foot print and dwell time? [5]
- (b) What are the major types of cellular interference? [5]

- (c) Consider a cellular system in which the total available voice channels to handle the traffic are 1200. [5]
The area of each cell is 9 km^2 and the total coverage area of the system is 3600 km^2 . Determine the system capacity if the cluster size is 4.
11. (a) Explain the call flow of mobile originated call and mobile terminated call flow in GSM with diagrams. [6]
- (b) Explain the different GSM channel types. [5]
- (c) Explain GMSK modulation scheme. [4]

*** END OF PAPER ***

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