VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD

M.E. I Year (ECE) II-Semester (Main) Examinations, July-2016

(Communication Engineering & Signal Processing)

Wireless Communications and Networking

Time: **3** hours
Max. Marks: **70**

Note: Answer ALL questions in Part-A and any FIVE from Part-B

Part-A (10 × 2=20 Marks)

1. Define Coherence bandwidth and coherence time.

2. List out features of OFDM.

3. Give the merits of GSM.

4. Differentiate wired and wireless networks.

5. Given a 2-branch selection combing system operated with independent Rayleigh fading, calculate the diversity gain for a probability of 10^{-6}.

6. Write about Jackes channel model.

7. Define frequency reuse.

8. Distinguish between diversity gain and antenna gain.

9. Briefly explain about scaternet in Bluetooth.

10. A Rake receiver is used in the wideband CDMA system with a spreading rate of 3.84 Mcps to reduce the multipath effect in the channel. What is the minimum delay difference to successfully resolve the multipath components and operate the RAKE receiver?

Part-B (5 × 10=50 Marks)
(All bits carry equal marks)

11. a) What is small scale fading? Describe different types of small scale fading channels.

    b) Given that transmitter radiates at a carrier frequency of 1750 MHz and when vehicle speed is 70 mph, calculate the receiver carrier frequency, if mobile is moving in perpendicular to the direction of arrival of transmitted signal.

12. a) Explain the principle of Space Time OFDM system.

    b) Consider 3-branch selection combiner diversity system in which each branch receives an independent Rayleigh fading signal. If the average SNR is 30 dB, determine the probability that the SNR will drop below 10 dB. Compare the result of the system without any diversity.

13. a) What is handoff? Classify different types of handoff mechanisms and explain them.

    b) Consider a channel with doppler spread of 80 Hz. Calculate the time separation required in samples of the received signal such that the samples are approximately independent.

14. a) Describe the significance of transport layer protocols.

    b) Analyze packet error modeling on fading channel.

15. a) Describe about the routing techniques of wireless adhoc network.

b) Compare the performance characteristics of different diversity combining techniques used in wireless communication systems.

16. a) Compare all propagation techniques.

b) Explain SDMA multiple access technique.

17. Answer any **two** of the following:

a) Cellular Telephony.

b) In a location management network architecture, network signaling exchange is performed using the SS7 network. With reference to this, describe the role of each of the following entities:
   i) Service Switching Point (SSP)
   ii) Mobile Switching Center (MSC)
   iii) Visitor Location Register (VLR)

c) A spectrum bandwidth of 25 MHz is allocated for a mobile cellular communication system and each. Voice channel requires a band width of 25 KHz. Estimate the system capacity for the following cases:
   i) A high power base station covering entire area.
   ii) Coverage area divided into 20 cells with cluster size 4.
   iii) Coverage area divided into 100 cells with cluster size 1. Also comment on the results obtained.

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