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Code No.: 5212 M

VASAVI COLLEGE OF ENGINEERING (Autonomous), HYDERABAD
M.E. I Year (ECE) II-Semester (Make Up) Examinations, August-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 X 2=20 Marks)

1. Give the mathematical model of Jakes channel.
2. Draw the block diagram of RAKE demodulator.
3. Give the merits of FDMA over TDMA.
4. Distinguish between fixed channel assignment and dynamic channel assignment.
5. If a base station covers 1 Km radius in a plain open area modelled as a 2-ray channel, what would be the coverage if it was used with free space communications?
6. What is Mobile IP?
7. A hexagonal cellular system has a cluster size of 4 cells as the basic model for frequency reuse implementation. Calculate reuse distance, if the radius of the hexagonal cell is 5 Km.
8. Discuss mobility management.
9. Compare piconet and scatternet in Bluetooth.
10. Calculate the time separation required for two signals to achieve a high degree of time diversity in a classical Rayleigh channel at 900 MHz with a mobile speed of 10 Km/ hour.

Part-B (5 × 10=50 Marks)

(All bits carry equal marks)

11. a) What is small scale fading? Classify and describe different types of small scale fading channels.
b) Given that transmitter radiates carrier frequency of 1550 MHz and vehicle speed is 50 mph, calculate the receiver carrier frequency, if mobile is moving towards and away from transmitter.
12. a) Find out and analyse the space time OFDM and space diversity techniques.
b) Compare diversity techniques and channel coding techniques.
13. a) What is handover? Classify handover mechanisms and explain them.
b) Compare the interface specifications of CDMA and GSM.
14. a) Describe the significance of transport layer protocols.
b) Analyse packet error modeling on fading channel.
15. a) Describe about the routing techniques of wireless adhoc network.
b) Compare IS 95 and GPRS wireless data networks.

16. a) Derive the expression for received signal power for 2-ray ground reflected propagation model with the help of neat diagram.
 b) Compare Erlang capacity of FDMA and TDMA access techniques.

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

- a) Coherence bandwidth and coherence time.
 b) A cellular system uses a frequency reuse factor of 1/4. If the path loss exponent is 4 and cell radius is 5 km, estimate the following:
 i) SIR of the system with no cell sectoring.
 ii) SIR of the system with 60° cell sectoring.
 iii) SIR of the system with 120° cell sectoring.
 c) Describe the concept of frequency reuse factor with an example.
