R09

Code No: D4506, D6102, D7004, D6502, D3804

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
M.TECH II - SEMESTER EXAMINATIONS, APRIL/MAY 2012
WIRELESS COMMUNICATIONS AND NETWORKS
(COMMON TO SYSTEMS & SIGNAL PROCESSING, COMMUNICATION SYSTEMS, ELECTRONICS & COMMUNICATION ENGINEERING, WIRELESS & MOBILE COMMUNICATIONS, DIGITAL ELECTRONICS & COMMUNICATION SYSTEMS)

Time: 3hours **Max. Marks: 60**

Answer any five questions
All questions carry equal marks
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1. A certain city has an area of 1.300 square miles and is covered by a cellular system with a seven cell reuse pattern. Each cell has a radius of 4 miles & city is allocated 40 mHz of spread spectrum with a full duplex channel bandwidth of 60KHz. Assume GOS of 2% FOR Er long B system. If offered traffic per user is 0.03 Erlangs, Compute
   i) Number of cells in the coverage area.
   ii) Total no. of channels per cell.
   If traffic intensity of each cell A=84 Erlangs/ cell. Then find
   iii) Maximum carried traffic
   iv) Total number of uses at 2% GOS
   v) Number of mobiles per unique channel
   vi) Theoretical maximum number of mobiles served at one time.

2.a) Derive the equation for capacity of CDMA cellular system.
   b) A cellular system operator is allocated a total spectrum of 5 MHz for deployment of an analog cellular system based on the FDMA technique, with each simplex channel occupying 25 KHz band width. Compute the number of simultaneous calls possible in the system.

3.a) Explain different kinds of traffic routing techniques in wireless networks.
   b) Explain in detail about X.25 protocol. What does the X.25 provide in the area of error control/ detection?

4.a) With neat diagram explain protocol architecture of Signaling System-7 (SS7).
   b) Draw the block diagram of Integrated Services Digital Network (ISDN). Explain how ISDN defines a dedicated signaling network to compliment PSTN.

5.a) With help of a diagram explain the WAP programming model.
   b) Explain in detail about:
   i) Infrared LANs ii) Spread-spectrum LANs iii) Narrowband microwave LANs

6. Explain IEEE 802.11 architecture and services in detail.

7.a) Explain in detail about Traffic Channels (TCH) and Control Channels (CCH) in GSM.
   b) Explain in detail about MAC protocols and Transport layer protocols.

8.a) What is the purpose of using RTS/CTS in CSM/CA protocol? List the relative advantages and disadvantages of basic CSMA/CA with that of RTS/CTS protocols.
   b) Explain various methods of improving the capacity of cellular radio systems.

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