Code No: 58032

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD
B. Tech IV Year II Semester Examinations, May - 2016
WIRELESS COMMUNICATION AND NETWORKS
(Common to ECE, ETM)

Time: 3 Hours   Max. Marks: 75

Answer any Five Questions
All Questions Carry Equal Marks
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1.a) Explain about the Public Switched Telephone Network (PSTN).
 b)   Briefly explain evolution of mobile radio communication.   [7+8]

2.a) Explain the logic link control of Bluetooth.
 b)   Bring out the salient features of third generation wireless networks.   [7+8]

3.a) Why sectorization of cell is very important and writes its advantages?
 b)   What is hand-off process? Explain the hand-off mechanism?
 c)   Prove that for a hexagonal geometry, the co-channel reuse ratio is given by
      $Q = \sqrt{3N}$, where $N = i^2 + ij + j^2$.   [4+4+7]

4.a) Distinguish between FDMA and SDMA with a neat sketches.
 b)   Explain in detail the operation of spread spectrum multiple accesses.   [7+8]

5.a) Briefly explain about Traffic Routing in wireless networks.
 b)   Discuss briefly about the development of wireless networks.   [7+8]

6.a) Explain how location and management is achieved in GPRS?
 b)   Explain about packet and frame formats in IS-95.   [7+8]

7.a) Mention the functional requirements of Hyper LAN.
 b)   Explain the functioning of WATM with basic architecture.   [7+8]

8.a) Differentiate between Single channel system and Multi channel system.
 b)   Derive mathematical representation of OFDM signal.   [7+8]

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Code: R7420405

R7

B.Tech IV Year II Semester (R07) Supplementary Examinations March/April 2013

WIRELESS COMMUNICATION AND NETWORKS
(Common to ECE, E.Con.E and ECC)

Time: 3 hours   Max Marks: 80

Answer any FIVE questions
All questions carry equal marks
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1   Explain the difference between different multiple accessing techniques.

2   What are the disadvantages of fixed telephone network? Explain how wireless telephone network is advantages on than fixed network.

3   Write short note on:
   (a)   CDPD.
   (b)   RMD.

4   Explain about WAP architecture.

5   Explain about MAC sublayer.

6   Explain about logical link control and adaption protocol.

7   Explain GPRS in detail.

8   Explain about adhoc networking.

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IV B.Tech II Semester Examinations,April/May 2012
WIRELESS COMMUNICATIONS AND NETWORKS
Common to Electronics And Computer Engineering, Electronics And
Telematics, Electronics And Communication Engineering
Time: 3 hours　　　　　　　　　　　　　　　　　　Max Marks: 80
Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Discuss the historical overview of wireless communications.

   (b) Illustrate the wireless communication network with a neat diagram.　　[8+8]

2. Explain the following:

   (a) BTMA (busy tone multiple access)

   (b) CSMA (CSMA with collision detection)

   (c) DSMA (data sense multiple access)

   (d) RAMA (resource auction multiple access).　　[16]

3. (a) What are the major requirements of wireless LANs?

   (b) Discuss about the configuration and transmission issues of spread spectrum wireless LANs?　　[8+8]

4. (a) Name the four states that a Bluetooth terminal can take and explain the difference among these states?

   (b) Name the three classes of applications that are considered for Bluetooth technology and identify those which can also be 802.11 and HIPERLAN WLAN technologies?　　[8+8]

5. Name mechanism to improve web access for hand held devices. What is their common problem and what led finally to the development of WAP?　　[16]

6. (a) Discuss WAP architecture with neat schematics

   (b) Explain the following protocols in CDPD:
     i. Mobile data link protocol (MDLP).
     ii. Radio resource management protocol (RRMP).　　[8+8]

7. (a) What is the relation between master and slave in a pico net?

   (b) List the undesirable propagation characteristics with millimeter wave systems?　　[8+8]

8. (a) What are the differences between the air interfaces of GPRS and CDPD?

   (b) Describe about short message servicing?　　[8+8]

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IV B.Tech II Semester Examinations,April/May 2012
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Time: 3 hours

Max Marks: 80

Answer any FIVE Questions
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1. (a) Discuss the different classes of service provided by SSCP in SS7 signaling.

   (b) Discussing the signaling load for call setup and Hand Off(handled by SS7) mechanisms. [8+8]

2. (a) Discuss about mobility management in wireless ATM?

   (b) Explain the general difference between the packet format of the ATM and wireless ATM? [8+8]

3. Draw the system architecture for GPRS and explain? [16]

4. (a) What are the different states and modes occupied by a Bluetooth device?

   (b) Write the packet format for the connectionless service of the L2CAP. [8+8]

5. (a) When would each of the three transaction classes be used?

   (b) List and briefly define the security services provided by WTLS. [8+8]

6. Write about the following:

   (a) IEEE802.11a

   (b) IEEE802.11b. [8+8]

7. (a) Mention the key differences between first and second generation cellular system.

   (b) Discuss the advantages of using CDMA for a cellular network. [8+8]

8. (a) Mention the salient features of TDMA

   (b) Consider global system for mobile, which is a TDMA / FDD system that uses 25 MHz for the forward link which is broken in to radio channels of 200 KHz. If 8 channels are supported on a single radio channel and if the guard band is assumed, find the number of simulations used that can be accommodated in GSM. [8+8]

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R07

Set No. 1

IV B.Tech II Semester Examinations,April/May 2012
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Answer any FIVE Questions
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1. (a) Define the efficiency of TDMA. Explain with necessary mathematical equations.

   (b) In an un-slotted ALOHA system, the packet arrival times form a Poisson process having a rate of 10^3 packets/ sec. If the bit rate is 10 Mbps and there are 1000 bits / packet. Find (i) the normalized throughput of the system and the number of bits per packet that will maximize the throughput.

2. (a) What are the two standard MAC protocols that are combined in the Home RF SWAP protocol?

   (b) Draw the typical packet frame format for wireless ATM? Explain each field of it?   [8+8]

3. (a) Write about shared mobile data networks?

   (b) Draw the reference architecture of the CDPD?   [8+8]

4. (a) What is WML? Discuss the WMLs important capabilities.

   (b) Explain the functioning of wireless application environment (WAE).   [8+8]

5. (a) What are the four modes of operation of the slave in the connection state?

   (b) Explain the continuously variable slope delta modulator (CVSD) scheme for voice encoding in Bluetooth.   [8+8]

6. (a) Mention the advantages of packet switched data.

   (b) What do you mean by Frequency Reuse? Explain the Various techniques of Frequency Reuse.   [8+8]

7. (a) Explain about ATM network concept.

   (b) Give the general structure of an ATM switch.   [8+8]

8. (a) How is authentication provided in wireless LAN?

   (b) Write about point Coordination function(PCF)?   [8+8]

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IV B.Tech II Semester Examinations,April/May 2012
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Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
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1. (a) What are the constraints on cellular networks to provide internet based mobile applications?
   (b) Explain the Handoff procedure in CDPD with neat diagram?   [8+8]

2. Discuss about access control achieved by the MAC layer?   [16]

3. (a) What is the difference between the MAC protocol of the Bluetooth and the IEEE802.11?
   (b) State the applications and limitations of adhoc networks?   [8+8]

4. (a) Compare the 2nd generation wireless networks with first generation networks.
   (b) Discuss the special characteristics of 3rd generation wireless networks.   [8+8]

5. Write about the following:
   (a) Telephony control protocol
   (b) Link manager protocol
   (c) Logical link control and adaptation protocol.   [16]

6. (a) Show that the maximum throughput in slotted ALOHA is given by 0.368.
   (b) Assume that a non-linear amplifier is used to broadcast FDMA transmissions for the US AMPS standard. If control channel 352 and voice channel 360 are simultaneously transmitted by a base station, determine all cellular channels on the forward link that might carry interference due to inter modulation.
                                                                                         [8+8]

7. (a) In a typical mobile IP implementation in a home agent, the agent maintains a mobility binding table to map mobile nodes home address to its care of address for packet forwarding. What entries are essential for each row of the table?
   (b) In WTLS, why is there a separate change cipher spec protocol, rather than including a change - ciper - spec message in the hand shake protocol.   [8+8]

8. (a) Discuss the different classes of service provided by SCCP (signaling connection Control part) of SS 7.
   (b) Discuss the signaling traffic in SS 7.   [16]

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IV B.Tech II Semester Examinations,APRIL 2011
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Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
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1. (a) Describe about short message servicing?
   (b) What is the number of bits in each burst of GPRS and how does it differ from a GSM burst?   [8+8]

2. (a) Explain the quality of service (QoS) requirements for adhoc networks?
   (b) Name the four states that a Bluetooth terminal can take and explain the difference among these states?   [8+8]

3. (a) What are the eleven commands offered by L2CAP?
   (b) Discuss the quality of service parameter in L2CAP.   [8+8]

4. (a) Explain packet flow if two mobile nodes communicate and both are in foreign networks. What additional router do packets take if reverse tunneling is required?
   (b) What are the primary goals of the WAP forum efforts and how are they reflected in the WAP protocol architecture?   [8+8]

5. (a) Draw the configuration of IEEE802.11 architecture?
   (b) Explain the physical layer specifications of IEEE802.11 using infrared? [8+8]

6. CSMA is a contention access protocol with partial co-ordination among multiple users. Explain why and how CSMA should provide better throughput performance than ALOHA systems. Plot the throughput curves and give your comments. [16]

7. (a) Explain about the public switched telephone network (PSTN).
   (b) Explain how a PBX may be used to provide telephone connections throughout a building.   [8+8]

8. (a) Discuss the link layer characteristics of CDPD.
   (b) Explain the advanced radio information system (ARDIS).   [8+8]

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Code No: 07A80404 **R07** **Set No. 4**

IV B.Tech II Semester Examinations,APRIL 2011
WIRELESS COMMUNICATIONS AND NETWORKS
Common to Electronics And Computer Engineering, Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours   Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) Discuss about the security aspects in the Bluetooth.
   (b) What are the elements in the core protocols?   [8+8]

2. (a) Distinguish between wireless and fixed telephone networks.
   (b) Mention the limitations of wireless networks.   [8+8]

3. (a) Explain ATM virtual circuits with a neat figure.
   (b) Explain the functioning of OMAP (operation maintenance and administration part).   [8+8]

4. (a) Mention the various multiple access techniques that are used in various wireless Communication systems.
   (b) Find the inter modulation frequencies generated if a base station transmits two carrier frequencies at 1930 MHz and 1932 MHz that are amplified by a saturated clipping amplifier. If the mobile band is allocated from 1920 MHz to 1940 MHz designate the IM frequencies that lie inside and outside the band.
                                                                                    [8+8]

5. (a) Discuss about type1 operation of logical link control?
   (b) Write the differences between HDLC and logical link control?   [8+8]

6. (a) Explain the nature of the interference between the Bluetooth and IEEE 802.11b?
   (b) What is the difference between a logical and a transport channel in HIPER-LAN2?   [8+8]

7. (a) Explain about forward channel and reverse channel in CDPD physical layer?
   (b) What are the new elements added to the AMPS infrastructure to support CDPD?   [8+8]

8. (a) In an typical mobile IP implementation in a home agent, the agent maintains a mobility binding table to map a mobile nodes home address to its care of address for packet forwarding. What entries are essential for each row of the table?
   (b) In WTLS, why is there a separate change cipher spec protocol, rather than including a change - ciper - spec message in the hand shake protocol.   [8+8]

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IV B.Tech II Semester Examinations,APRIL 2011
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Time: 3 hours   Max Marks: 80
Answer any FIVE Questions
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1. (a) What are the constraints on cellular networks to provide internet based mobile applications?
   (b) Explain the Handoff procedure in CDPD with neat diagram?   [8+8]

2. (a) List the international frequency allocations for Bluetooth.
   (b) Discuss about the adhoc systems.   [8+8]

3. (a) Explain the functions of SS 7 user part.
   (b) Discuss the various services provided by SS 7.   [8+8]

4. (a) What is the principal application that has driven the design of circuit switching network.
   (b) Distinguish between static and alternate routing in a circuit switching network.
                                                                                     [8+8]

5. Differentiate between distributed access protocols and centralized access protocols at MAC layer?   [16]

6. (a) Discuss the cell capacity of TDMA system.
   (b) Compare the multiple access techniques in terms of modulation, FEC coding, diversity, system complexity and multiple access interference (MAI).   [8+8]

7. (a) What problems of HTTP can WSP solve? Explain why these solutions are needed in wireless mobile environment.
   (b) What advantages does a connectionless session service offer compared to a simple datagram service?   [8+8]

8. (a) Draw the block diagram of OFDM modem and explain functionality of each block?
   (b) Explain the differences between the medium access control mechanisms of the HIPERLAN2 and IEEE802.11?   [8+8]

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R07 **Set No. 3**

IV B.Tech II Semester Examinations,APRIL 2011
WIRELESS COMMUNICATIONS AND NETWORKS
Common to Electronics And Computer Engineering, Electronics And Telematics, Electronics And Communication Engineering

Time: 3 hours · Max Marks: 80

Answer any FIVE Questions
All Questions carry equal marks
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1. (a) What is the difference between a virtual channel and a virtual path.
   (b) Compute the end to end delay for circuit switching, virtual circuit packet switching and datagram packet switching for N = 4, L = 3200, B = 9600, P = 1024, H =16, S = 0.2 seconds D = 0.001. [8+8]

2. Discuss the following quality of service (QOS) parameters in Bluetooth:
   (a) token bucket size
   (b) delay variation
   (c) peak bandwidth
   (d) maximum transmission unit. [8+8]

3. Draw the system architecture for GPRS and explain that? [16]

4. (a) Discuss the applications supported by IEEE802.15 home RF technology?
   (b) Explain any one routing protocol in adhoc networking? [8+8]

5. (a) With timing diagram explain the basic access method in distribution Coordination function (DCF)?
   (b) Discuss the wired equivalent privacy algorithm for wireless LAN? [8+8]

6. (a) What are the functional areas supported by WML? Explain.
   (b) Explain the services provided by WSP. [8+8]

7. (a) What is meant by near-far effect in CDMA and explain how this effect is eliminated.
   (b) In a CDMA system, the required E_b/I_o is 7dB and the processing gain is 22dB. Find the number of available users, assuming that there is no forward power control. [8+8]

8. (a) Explain about ATM network concept.
   (b) Give the general structure of an ATM switch. [8+8]

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