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Eighth Semester B.E. Degree Examination, June/July 2011
Wireless Communication

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions selecting*
at least TWO questions from each part.

PART – A

1 a. Describe with a block diagram the AMPs cellular system. Illustrate with a diagram the various signals that flow over the AMPs forward and reverse channels.   **(10 Marks)**
   b. With flow diagrams explain how a mobile – mobile call is established in AMPs system.
                                                                                (06 Marks)
   c. List the characteristics of 3G mobile networks assuming cell size and mobile speed as reference.   **(04 Marks)**

2 a. With a block diagram, explain the MSC subsystem.   **(07 Marks)**
   b. Describe the subscription profile of HLR and its usage in handoff.   **(06 Marks)**
   c. Define and explain |ME| used in international mobile networks.   **(07 Marks)**

3 a. Define : i) Reuse number ; ii) Interferences in mobile systems.   **(05 Marks)**
   b. For a mobile service provider, license is provided for 5 MHz and provides 10 kHz of bandwidth to every user. Considering a single transmitter site, 500 users get connectivity simultaneously. If however service provider implements a cellular system with 35 transmitter sites and cluster size, determine the new system capacity. Also, if mobile system has a cluster size of 7, determine frequency reuse distance for a cell radius of 5 kms.
                                                                                (05 Marks)
   c. With relevant figures, explain a typical cellular handoff operation.   **(10 Marks)**

4 a. List the services provided by GSM. Explain briefly.   **(07 Marks)**
   b. Find the maximum number of subscribers who can get connectivity simultaneously in a GSM network. What are the features of SIM card in a GSM system?   **(06 Marks)**
   c. Describe the frame format used for GSM traffic.   **(07 Marks)**

PART – B

5 a. Explain in detail the registration and call setup procedures in GSM.   **(10 Marks)**
   b. Describe GSM ciphering mode settling operations and |ME| check.   **(10 Marks)**

6 a. With a block diagram, explain IS95 CD MA architecture.   **(08 Marks)**
   b. Compare the FDMA, TDMA and CDMA interfaces.   **(05 Marks)**
   c. Explain spreading procedure used on CDMA forward channels.   **(07 Marks)**

7 a. Describe the path loss model used for analyzing wireless channels. What are the parameters affecting signal transmission on wireless channels? Find the received power at a distance of 1 km for a transmitting 900 MHz. Assume transmitting and receiving antenna gains as zero dB.   **(08 Marks)**
   b. Explain the concept of block inter learning.   **(05 Marks)**
   c. Differentiate between space and polarization diversity scheme. What are advantages of employing diversity?   **(07 Marks)**

8 a. List the features of 1EEE 802.11x technologies.   **(05 Marks)**
   b. Describe the Bluetooth protocol stack with relevant figures.   **(08 Marks)**
   c. Explain the two types of links defined by Bluetooth standards.   **(07 Marks)**

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Eighth Semester B.E. Degree Examination, June/July 2011
Embedded System Design

Time: 3 hrs.

Max. Marks:100

Note: *Answer FIVE full questions selecting*
at least TWO questions from each part.

PART – A

1 a. What is a design metric? Mention the design metric and explain them.   (10 Marks)
   b. Derive an equation for percentage revenue loss for any rise angle rather than just for 45 degrees.   (10 Marks)

2 a. Design a single-purpose processor that outputs Fibonacci numbers up to 'n' places. Start with a function computing the designed result and translate it into a state diagram. (10 Marks)
   b. Design a combinatorial logic for y and z where y is 1, if a is 1, or 'b' and 'c' are 1 and z is 1 if 'b' or 'c' is 1, but not both (or a, b and c are all 1).   (10 Marks)

3 a. What is watchdog timer? Explain ATM timeout using a watchdog timer.   (10 Marks)
   b. Describe the working of PWM unit with timing diagrams. How can it be used for speed control of DC motor?   (10 Marks)

4 a. Explain the features of flash memory, SRAM and OTP ROM.   (06 Marks)
   b. Explain memory hierarchy and cache operation.   (08 Marks)
   c. Design a 8k×8 ROM using 1k×8 ROM using an address decoder.   (06 Marks)

PART – B

5 a. Explain shared data problem with an example, show how interrupt facility can be used for solving the problem.   (10 Marks)
   b. Explain interrupt handling procedure, context switching and critical section.   (10 Marks)

6 a. Briefly compare the methods for intertask communication.   (10 Marks)
   b. Give drawbacks of 'malloc' and 'free' library functions of C in real time systems. Explain getbuf and regbuf using program code.   (10 Marks)

7 a. Explain interrupt routines in RTOS environment.   (10 Marks)
   b. What is meant by encapsulating the semaphores? Bring out the need for it.   (10 Marks)

8 a. Explain how memory space can be saved in hard real time scheduling with an example.   (10 Marks)
   b. Discuss any five problems with semaphores.   (10 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2011
Network Security

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions selecting*
at least TWO questions from each part.

PART – A

1 a. Define security attacks and briefly define categories of passive and active security attacks.
(08 Marks)

   b. Encrypt the plaintext "MONDAY" using Hill cipher with the key $\begin{pmatrix} 9 & 4 \\ 5 & 7 \end{pmatrix}$. Show your
calculation and cipher text. [Hint: a = 0, b = 1……. z = 25]   (08 Marks)

   c. List the final set of criteria used by NIST to evaluate candidate AES cipher.   (04 Marks)

2 a. Draw the single round of DES algorithm and explain the process.   (10 Marks)

   b. Describe the block cipher modes of operation in detail.   (10 Marks)

3 a. Users A and B use the Diffie-Hellman key exchange technique with a common prime q = 11
and a primitive root α = 5.

   i)   If user A has private key X_A = 3, what is A's public key Y_A?

   ii)   If user B has private key X_B = 2, what is B's public key Y_B?

   iii)   What is the shared secret key K_A and K_B?   (06 Marks)

   b. What requirement must a public key cryptosystem fulfill to be a secure algorithm?(06 Marks)

   c. Explain the RSA algorithm in detail.   (08 Marks)

4 a. List and explain the three general approaches to deal with replay attacks.   (08 Marks)

   b. Define the classes of message authentication functions.   (06 Marks)

   c. Describe the requirements for a Hash function.   (06 Marks)

PART – B

5 a. Explain the two SSL concepts with their parameters.   (10 Marks)

   b. Describe the sequence of events that are required for a transaction in SET.   (10 Marks)

6 a. Briefly describe the 3 classes of intruder.   (06 Marks)

   b. Explain the password selection strategies in detail.   (08 Marks)

   c. Define intrusion detection and explain the architecture of distributed intrusion detection in
detail.   (06 Marks)

7 a. Briefly describe the most significant types of virus.   (12 Marks)

   b. What is DDoS? Describe the 3 lines of defence against DDoS stacks.   (08 Marks)

8 a. List the design goals of firewall.   (04 Marks)

   b. Explain the types of firewalls in detail with necessary sketch   (08 Marks)

   c. Explain briefly about the trusted systems.   (08 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2011
Fuzzy Logic

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions selecting*
at least TWO questions from each part.

PART – A

1   a.   Explain the concept of Fuzzy set with suitable examples.   (10 Marks)
    b.   Differentiate Fuzzy set from crisp set and name the properties of crisp set.   (10 Marks)

2   a.   Explain the various defuzzification methods.   (10 Marks)
    b.   Given two Fuzzy sets:

$$A = \left\{ \frac{1.0}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5} \right\} \text{ and } B = \left\{ \frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5} \right\}$$

Find i) B/A ii) $A \cap B$ iii) $A \cup \overline{A}$ iv) $\overline{B} \cup B$ v) $\overline{A \cap B}$ (10 Marks)

3   a.   Write a brief note on: i) Neural Networks ii) Genetic Algorithms   (10 Marks)
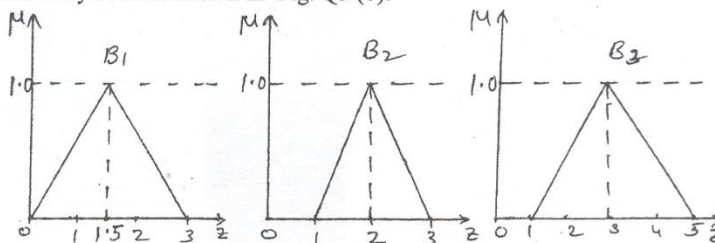   b.   Given three Fuzzy sets are shown in Fig. Q3 (b).

Fig. Q3 (b)

Find z* using i) COG ii) COS   (10 Marks)

4   a.   Explain Lamda cuts for Fuzzy sets and Fuzzy Relations.   (10 Marks)
    b.   Explain in brief functions of Fuzzy sets Extension principle.   (10 Marks)

PART – B

5   a.   With the help of truth table, Explain the Exclusive OR and Exclusive NOR logical proofs.
                                                                            (12 Marks)
    b.   Explain other forms of the Composition operations.   (08 Marks)

6   a.   Explain Aggregation of Fuzzy Rules.   (10 Marks)
    b.   Explain Graphical Mamdani inference method with crisp inputs.   (10 Marks)

7   Identify possible applications of fuzzy uses in
    a.   Computer science
    b.   Engineering
    c.   Medicine
    d.   Communication   (20 Marks)

8   a.   Explain Fuzzy C-means (FCM) with suitable example.   (10 Marks)
    b.   Explain multi objective Decision making with suitable example.   (10 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2011
Multimedia Communications

Time: 3 hrs.   Max. Marks:100

Note: *Answer FIVE full questions selecting*
at least TWO questions from each part.

PART – A

1   a. What is multimedia? State the basic form of representation of text, an image, audio and video. **(08 Marks)**
    b. List different types of multimedia networks. Explain any two networks in detail.   **(08 Marks)**
    c. Derive the maximum block size that should be used over a channel which has mean BER probability of 10^{-4} if the probability of a block containing on error and hence being discarded is to be 10^{-1}. **(04 Marks)**

2   a. Explain the following :
        i)   Quantization intervals
        ii)   Hyper text
        iii)   Raster scan principles
        iv)   Aspect ration
        v)   4:2:2 format. **(10 Marks)**
    b. With a neat diagram explain audio/sound synthesizer. **(06 Marks)**
    c. Assuming the bandwidth of speech signal is from 50 Hz to through 10 kHz and that of music signal is from 15 Hz to through 20 kHz. Derive the bit rate that is generated by the digitization procedure in each case assuming the Nyquist sampling rate is used, with 12 bits per sample for speech signal and 16 bits per sample for music signal. **(04 Marks)**

3   a. Encode the string "went". Comprising characters with probabilities of e = 0.3, n = 0.3, t = 0.2, w = 0.1, • = 0.1 using arithmetic coding. **(10 Marks)**
    b. With neat block diagram explain JPEG encoder. **(10 Marks)**

4   a. Describe third order predictive DPCM signal encoder and decoder. **(10 Marks)**
    b. With neat diagram, explain video compression principles. **(10 Marks)**

PART – B

5   a. Explain CSMA/CD and principle of operation of token ring. **(10 Marks)**
    b. Explain the LAN protocols. **(10 Marks)**

6   a. With example explain fragmentation and reassembly in the internet. **(10 Marks)**
    b. Explain datagram format of IPv6. **(10 Marks)**

7   a. Explain the ATM cell formats. **(10 Marks)**
    b. Explain LAN emulation in ATM. **(10 Marks)**

8   a. Explain TCP/IP protocol suite. **(10 Marks)**
    b. Explain RTP and RTCP. **(10 Marks)**

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