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06EC81

Eighth Semester B.E. Degree Examination, June/July 2013
Wireless Communications

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 neat flow diagram, the AMPS initialization operation. (12 Marks)
b. Briefly discuss the characteristics of 3G mobile network. (08 Marks)
- 2 a. Discuss the functions of transcoder controller in a base station system. (06 Marks)
b. With a relevant flow diagram briefly explain the call release operation. (10 Marks)
c. State the role of AUC in the mobile authentication process. (04 Marks)
- 3 a. What are different types of hand off? Explain the hand off operation with relevant figures. (10 Marks)
b. Explain the concept of power control and management in a typical cellular network. (10 Marks)
- 4 a. Explain with a neat block diagram the GSM network interfaces. (08 Marks)
b. Discuss the various dedicated control channels of GSM. (06 Marks)
c. Write a short note on various frame formats used for GSM traffic. (06 Marks)

PART – B

- 5 a. Explain with a neat flow diagram the authentication and ciphering mode operation in a GSM call set up operation. (12 Marks)
b. Explain the intra BSC-hand over operation in GSM. (08 Marks)
- 6 a. Explain in detail the CDMA forward channel frame format. (10 Marks)
b. Explain with a neat flow diagram the mobile terminated call timeline in CDMA systems. (10 Marks)
- 7 a. Discuss the concept of convolutional and turbo encoders. (06 Marks)
b. Explain in detail the various path loss models. (10 Marks)
c. Draw a neat block diagram of RAKE receiver. (04 Marks)
- 8 a. List the features of IEEE 802.11X technologies. (05 Marks)
b. Describe basic wireless MAN. (07 Marks)
c. Explain details of Bluetooth protocol stack with relevant figures. (08 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2013

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 an embedded system? Define the three main characteristics of embedded systems that distinguish such systems from other computing systems. (04 Marks)
 - b. Derive the percentage revenue loss equation for a rise angle of 35° . Compute the percentage revenue loss if the products life time is 10 weeks and the delay in market is 5 weeks. (08 Marks)
 - c. Define the three main IC technologies. What are the benefits of using each of the three different IC technologies? (08 Marks)

- 2
 - a. Write a simple algorithm for finding the greatest common divisor of two numbers. Write the FSM for this algorithm and explain how it can be optimized and write the optimized FSM. (10 Marks)
 - b. Design a soda machine controller, given that a soda costs 75 cents and your machine accepts quarters only. Draw a block diagram, come up with a state diagram and state table, minimize the logic and then draw the final circuit. (10 Marks)

- 3
 - a. Explain how a stepper motor is controlled using driver. Give relevant hardware and software details. (08 Marks)
 - b. The analog input range for an 8 bit ADC is from -2.5 V to +7.5 V. Determine the resolution of ADC and digital output in hexadecimal when the input voltage is 1.2 V. Trace successive approximation steps and show the binary output of the ADC. (08 Marks)
 - c. A watchdog timer that uses two cascaded 16 bit up counters is connected to an 11.981 MHz oscillator. A timeout should occur if the function watchdog_reset is not called within 5 minutes. What value should be loaded into the upcounter pair when the function is called? (04 Marks)

- 4
 - a. Describe fully associative cache mapping technique. (06 Marks)
 - b. Given the following three cache designs, find the one with the best performance by calculating the average cost of access. Show all calculations:
 - i) 4 K byte, 8-way set associative cache with a 6% miss rate; cache hit costs one cycle, cache miss costs 12 cycles.
 - ii) 8 K byte, 4-way set associative cache with a 4% miss rate; cache hit costs two cycles, cache miss costs 12 cycles.
 - iii) 16 K byte, 2-way set associative cache with a 2% miss rate; cache hit costs three cycles, cache miss costs 12 cycles. (08 Marks)
 - c. With a neat diagram, explain the advanced RAM architecture. Also explain how this is extended to improve the performance through synchronous DRAM. (06 Marks)

PART – B

- 5 a. Describe shared data problem with an example. Show how disable/enable interrupt can be used for solving this problem. (10 Marks)
- b. What is interrupt latency? What factors affecting it? (04 Marks)
- c. Consider three processes with high, medium and low priorities respectively require an execution time of 150 μ sec, 250 μ sec and 350 μ sec. If the interrupts are disabled for 200 μ sec and the deadline for the low priority process is 850 μ sec, determine its worst case interrupt latency. Can it meet the deadline, if the other two interrupts occur? Illustrate with a timing diagram. (06 Marks)
- 6 a. What are semaphores? Explain the semaphore problems in RTOS. (07 Marks)
- b. Explain the RTOS functions “take semaphore” and “release semaphore” with an example. (06 Marks)
- c. What is a task? Explain the three different task states. (07 Marks)
- 7 a. Describe the two rules that an RTOS environment must flow for interrupt routines. (08 Marks)
- b. Explain the advantages and disadvantages of using larger number of tasks in RTOS. (06 Marks)
- c. Identify the bug in the following program and explain:
- ```

Void Task1(void)
{
 :
 :
 VcountErrors (a) ;
 :
 :
}
Void Task 2(Void)
{
 :
 :
 VcountErrors (11) ;
 :
 :
}
Static int cErrors ;
Void VcountErrors (int CNew Errors)
{
 CErrors += CNewErrors ;
}

```
- (06 Marks)
- 8 a. Explain “encapsulating semaphores” with an algorithm. (08 Marks)
- b. Explain the methods to save code space and methods to save power. (08 Marks)
- c. What is an event? Explain the three standard features of it. (04 Marks)

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06EC832

**Eighth Semester B.E. Degree Examination, June/July 2013**  
**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. Draw the model of network security. Explain it briefly. (06 Marks)  
b. Distinguish passive and active attacks. With a figure explain masquerade attack. (04 Marks)  
c. Explain the working of the playfair cipher with an example. (10 Marks)
- 2 a. Distinguish block cipher and stream cipher with examples. (08 Marks)  
b. Explain block cipher design principles. (08 Marks)  
c. Briefly describe about steganography. (04 Marks)
- 3 a. Distinguish differential and linear cryptanalysis. (04 Marks)  
b. Which parameters and design choices determine the actual algorithm of a Festal Cipher? (06 Marks)  
c. With a neat schematic, explain the single round of DES encryption model. (10 Marks)
- 4 a. Perform encryption and decryption using RSA algorithm for  $p = 3$ ,  $q = 11$ ,  $e = 07$  and  $m = 5$ . (10 Marks)  
b. Explain elaborately Diffie-Hellman key exchange. (10 Marks)

**PART – B**

- 5 a. List different types of threats and consequences when using the web. Also list countermeasures to be taken. (08 Marks)  
b. Elucidate SSL architecture. (08 Marks)  
c. Explain approaches to intrusion detection system. (04 Marks)
- 6 a. Give a detailed account on UNIX password management. (10 Marks)  
b. With a schematic, explain the typical steps in digital immune system. (10 Marks)
- 7 a. Describe about different types of firewalls. Enumerate the limitations of firewalls. (08 Marks)  
b. What are the common characteristics? (06 Marks)  
c. List the monitored behaviours of programs, a typical behaviour blocking software does. (06 Marks)
- 8 Write short notes on the following:  
a. Secure electronic transaction.  
b. Digital signature schemes.  
c. DDOS attack.  
d. Honey pots. (20 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg.  $42+8 = 50$ , will be treated as malpractice.



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06EC835

**Eighth Semester B.E. Degree Examination, June / July 2013**  
**High Performance Computer Networks**

Time: 3 hrs.

Max. Marks:100

**Note:** Answer any FIVE full questions, selecting atleast TWO question from each part.

**PART - A**

- 1
  - a. Tabulate the key innovations of different types of History of communications networks. (06 Marks)
  - b. Mention different aspects of networking principles and explain digitization and networks externalities, with relevant diagrams. (08 Marks)
  - c. A telephone network transmits a frequency of 4kHz and SNR is approximately equal to 48dB. Find i) Sampling rate ii) Number of bits per sample iii) Bit rate of the signal. (06 Marks)
- 2
  - a. Explain different principal network elements. (06 Marks)
  - b. Discuss layers of an open data network model, with relevant diagrams. (10 Marks)
  - c. An optical link transmits a 10,000 bit packet with a transmission speed of 1Mbps and it takes about 4 $\mu$ s to propagate through network. Find total delay of the network. (04 Marks)
- 3
  - a. Mention important aspects of Internet protocol. Explain class – based addressing in detail. (06 Marks)
  - b. Explain TCP and UDP header. (08 Marks)
  - c. Explain window adjustment technique in TCP. (06 Marks)
- 4
  - a. Explain SONET network elements and SONET overhead, with suitable diagrams. (10 Marks)
  - b. What is INA? Explain the network elements and its functional components. (10 Marks)

**PART - B**

- 5
  - a. List out the following, with respect to ATM network : i) Features of ATM ii) QoS parameters (attributes) iii) Types of delay. (06 Marks)
  - b. Explain ATM Header structure. (08 Marks)
  - c. Explain ATM adaptation layer, with a neat diagram. (06 Marks)
- 6
  - a. Explain architecture of wireless networks, with suitable diagrams. (06 Marks)
  - b. Explain cellular telephone systems. (10 Marks)
  - c. Discuss Adhoc wireless networks. (04 Marks)
- 7
  - a. Explain different control actions using different time scales. (06 Marks)
  - b. Discuss datagram networks queuing model and key queuing result, with suitable diagrams. (08 Marks)
  - c. Briefly explain Bellman – Ford algorithm. (06 Marks)
- 8
  - a. Describe WDM system, with neat diagram. (06 Marks)
  - b. Describe optical LANS, with relevant diagrams. (08 Marks)
  - c. Explain optical ring networks and Hierarchical mesh networks. (06 Marks)

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**Eighth Semester B.E. Degree Examination, June/July 2013**  
**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. Explain operational modes of multipoint conference. (07 Marks)
  - b. Explain multimedia data networks. (07 Marks)
  - c. Determine the propagation delay associated with the following communication channels:
    - i) a connection through a private telephone network of 1 km.
    - ii) a connection through a PSTN of 200 km.
    - iii) a connection over satellite channel of 50000 km.

Assume that the velocity of propagation of a signal in the case of, i) and ii) is  $2 \times 10^8 \text{ ms}^{-1}$  and in case of iii)  $3 \times 10^8 \text{ ms}^{-1}$ . (06 Marks)
2.
  - a. Explain the principle of operation of PCM speech codec with a block diagram. Also explain compressor and expander. (10 Marks)
  - b. Describe raster scan operation associated with TV / computer monitor. (07 Marks)
  - c. Assuming the bandwidth of speech signal is from 50 Hz through 10 kHz and that of music signal is from 15 Hz through to 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/sample for speech signal and 16 bits/sample for music signal. Derive the memory required to store 10 minutes passage of stereophonic music. (03 Marks)
3.
  - a. Code the given string “A B A C A D A B A C A D A B A C A B A B” using Huffman coding. Derive Huffman code tree. (06 Marks)
  - b. With the help of a diagram, explain the main stages of operation of JPEG encoder and decoder in detail. (14 Marks)
4.
  - a. With the help of a neat diagram, explain LPC encoder and decoder. (10 Marks)
  - b. With a neat diagram, explain video compression principles. (10 Marks)

**PART – B**

5.
  - a. Explain the LAN protocols and protocol frame mark. (10 Marks)
  - b. Explain in detail, with diagrams, the token ring configuration, frame formats, frame transmission and reception with priority operation. (10 Marks)
6.
  - a. Explain fragmentation and reassembly in the internet in detail. (10 Marks)
  - b. Describe the operation of ARP and RARP. (10 Marks)
7.
  - a. Explain ATM cell formats. With the help of cell switching schematic, explain how cells are routed through ATM switch. (12 Marks)
  - b. Explain classic IP over ATM (IPOA) LAN. (08 Marks)
8.
  - a. Explain TCP/IP protocol suit. (10 Marks)
  - b. Explain RTP and RTCP. (10 Marks)



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## Eighth Semester B.E. Degree Examination, June/July 2013

### Global System for Mobile Communication

Time: 3 hrs.

Max. Marks:100

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

#### PART – A

1.
  - a. With a neat diagram, explain the mapping of GSM layers onto OSI layers. (07 Marks)
  - b. Write short notes on the following:
    - i) MS subsystem
    - ii) BSS
    - iii)NSS (06 Marks)
  - c. With relevant figure, explain GSM PLMN structure. Explain its objectives and services. (07 Marks)
  
2.
  - a. List the future techniques available to reduce interference in GSM. Explain in brief. (08 Marks)
  - b. Mention the radio link measurements in terms of signal level and quality levels used in GSM. (04 Marks)
  - c. Consider a GSM system with the following data to show the advantages of adaptive array antennal:
    - Coverage area : 60000 mile<sup>2</sup>
    - Channel spacing : 200 kHz
    - MS output power (w) : 800 mW (29 dBm)
    - Receive cable/connector loss (L<sub>c</sub>) : 2 dB
    - Required S/E ratio : 12 dB
    - Receive noise figure (F) : 7 dB
    - One-mile path loss interrupt (I<sub>0</sub>) : 80 dBm
    - One way system band width : 12.5 MHz.
    - Frequency reuse : 4
    - BS antenna gain (G<sub>bs</sub>) : 20 dBi
    - MS antenna gain (G<sub>m</sub>) : 0 dB
    - Information rate : 271 Kbps
    - Propagation path loss exponent  $\gamma$  : 4
    - Lognormal fading margin (f<sub>m</sub>) : 10 dB
 Calculate:
    - i) Minimum received power
    - ii) Maximum allowable path loss
    - iii) Cell radius in miles
    - iv) Number of cells required to cover the service area. (08 Marks)
  
3.
  - a. With a neat diagram, explain the data encryption in GSM. (06 Marks)
  - b. Describe the mobile identification process with the flow diagram. (06 Marks)
  - c. Explain various burst used in GSM with the help of neat diagram. (08 Marks)
  
4.
  - a. Mention the various speech coding methods. Explain the attributes of speech coder. (08 Marks)
  - b. Compare the different ITU speech coders. (04 Marks)
  - c. What are vocoders? Explain the working of full rate vocoder with relevant diagram. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

**PART – B**

- 5 a. List the various GSM teleservices and supplementary service. (06 Marks)  
b. Explain the GSM call setup by an MS flow scenario. (10 Marks)  
c. Explain SMS in brief with the help of relevant figure. (04 Marks)
- 6 a. Explain the file structure of SIM card with a neat block diagram. (07 Marks)  
b. List the various security algorithms used in GSM. Explain them in brief. (09 Marks)  
c. What do you mean by token-based authentication? (04 Marks)
- 7 a. Describe the factors to be considered while designing a wireless system. (08 Marks)  
b. Write a note on teletraffic models. (06 Marks)  
c. Explain the planning of a wireless network. (06 Marks)
- 8 a. What are the fire TMN layers in M3010? Explain the pertinent three TMN layers. (08 Marks)  
b. Explain the TMN management services. (06 Marks)  
c. What are the management requirements for wireless network? Explain briefly. (06 Marks)

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