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06EC81

Eighth Semester B.E. Degree Examination, May/June 2010
Wireless Communication

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Briefly explain the different generations of cellular systems. **(10 Marks)**

b. Explain the AMPS (advanced mobile phone system) network operations, for a mobile originated call. **(10 Marks)**

2 a. What is the function of the visitor location register? **(04 Marks)**

b. Explain the purpose of global title and global title translation for a cellular system. **(06 Marks)**

c. What are the functions of the mobile switching centre (MSC)? With a neat block diagram, explain the components of the MSC. **(10 Marks)**

3 a. Explain the differences between cell splitting and cell sectoring. **(06 Marks)**

b. Explain the concept of mobility management. With a figure, explain the three basic functions performed by the location management. **(10 Marks)**

c. Write a note on network security. **(04 Marks)**

4 a. Explain with a neat schematic, the GSM network interfaces and protocols. **(10 Marks)**

b. Briefly explain the GSM channel concept. **(10 Marks)**

PART – B

5 a. Define MSRN. What is the purpose of mobile station roaming number? Also explain the GSM call setup using the MSRN. **(10 Marks)**

b. Explain the TDMA concept. How it is implemented in GSM? **(10 Marks)**

6 a. Explain with a neat diagram, the network nodes found in a CDMA 2000 wireless system. **(10 Marks)**

b. Explain with a neat block diagram, the generation of the CDMA paging channel signal. **(10 Marks)**

7 a. Define OFDM. Briefly explain this OFDM technique. **(06 Marks)**

b. Explain the basic operation and characteristics of spread spectrum modulation systems. **(10 Marks)**

c. Define ultra – wide band radio technology. **(04 Marks)**

8 a. Explain the details of Bluetooth protocol stack, with a figure. **(10 Marks)**

b. Describe the basic wireless MAN. **(04 Marks)**

c. Describe the basic difference between a wireless LAN and a wireless PAN. **(06 Marks)**

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06EC82

Eighth Semester B.E. Degree Examination, May/June 2010
Embedded System Design

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Mention the characteristics and briefly list the design metrics of an embedded system. **(08 Marks)**

b. Determine the percentage of revenue loss if the products life time is 86 weeks and the delay in the market is 8 weeks. Derive the formula used for this calculation. **(06 Marks)**

c. Explain how the top-down design process improves the productivity. **(06 Marks)**

2 a. Briefly explain the purpose of the data path and controller in a single purpose processor. **(06 Marks)**

b. Write an efficient algorithm for finding the GCD of two integer numbers. Also explain how the FSMD for this can be optimized. **(08 Marks)**

c. Explain various addressing modes that are commonly used by processors, with an example. **(06 Marks)**

3 a. Explain how UART is used for communication. List its advantages. **(08 Marks)**

b. What is a watch dog timer? List its uses. A 16 bit timer operates at a clock frequency of 12 MHz. Determine the resolution and range of this timer. **(06 Marks)**

c. The analog input range for a 8-bit ADC is from -2.5V to 8.5V. Determine the resolution of ADC and digital output in hexadecimal, when the input voltage is 1.2V. Trace successive approximation steps and show the binary output of the ADC. **(06 Marks)**

4 a. What is memory hierarchy? How does the cache operate? Discuss the cache mapping techniques. List their merits and demerits. **(10 Marks)**

b. Briefly explain OTPROM, EEPROM, RDRAM and FPM DRAM. **(10 Marks)**

PART – B

5 a. Explain the need for interrupts in processors and mention briefly the various events that take place when a processor is interrupted. **(10 Marks)**

b. Explain the problems of shared-data interrupts and suggest the solution to solve the problems. **(10 Marks)**

6 a. Explain with an example, how the Round-Robin architecture works. What is its limitation? **(12 Marks)**

b. List the characteristics of four software architectures available for building embedded software. **(08 Marks)**

7 a. Mention the two rules of interrupt routines in an RTOS environment. With an example, briefly explain, what happens when each rule is violated. **(15 Marks)**

b. Describe the use of message queues. **(05 Marks)**

8 a. What is meant by encapsulating the semaphores? Bring out the need for it. **(08 Marks)**

b. Explain any six problems of semaphores. **(06 Marks)**

c. Explain the methods to solve memory space and methods to save power. **(06 Marks)**

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06EC835

Eighth Semester B.E. Degree Examination, May/June 2010
High Performance Computer Networks

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Compare the digital carrier systems (DCS) hierarchy and synchronous transfer signal (STS) hierarchy with reference to medium, signal and data rates. **(10 Marks)**

b. What is meant by: i) Economies of scale; ii) Network externalities; iii) Service integration? Explain. **(10 Marks)**

2 a. Give comparison between connection-oriented service and connectionless service. **(06 Marks)**

b. Explain open data network model. **(07 Marks)**

c. Explain principal network elements. Calculate the time required to transmit (TRANS) a packet of size 10,000 bit with a transmission speed of 1 Mbps. **(07 Marks)**

3 a. What are the important aspects of internet protocol? Explain 'routing' in detail. **(08 Marks)**

b. Explain the concept of 'Bell-man Ford algorithm' used by Bridges for spanning tree routing. **(08 Marks)**

c. What is an 'IP multicast backbone' (Mbone)? Explain its function. **(04 Marks)**

4 a. Explain the concept of 'window adjustment in TCP'. **(04 Marks)**

b. Draw a 'sonet frame'. Calculate STS-1 rate if one frame duration is 125 μs (micro seconds). **(08 Marks)**

c. What is an intelligent network? Specify its elements and explain the function of each of them. **(08 Marks)**

PART – B

5 a. Explain the quality of service (QOS) parameters (attributes) of ATM. **(07 Marks)**

b. Explain how the ATM bearer service can be implemented using SONET networks. **(07 Marks)**

c. If the link speed of STS-3 signal is 155 Mbps, given a cell size of 53 bytes, 90 percent loading and one cell per unit time as service rate, calculate: **(06 Marks)**
i) Unit of time (per bit) ii) Average number of cells in the buffer iii) Queuing delay

6 a. Discuss the power fall-off with distance due to path loss, shadow fading and flat fading in wireless channel. **(10 Marks)**

b. Enumerate and explain different architectures for wireless networks. **(06 Marks)**

c. Differentiate between home RF and Bluetooth. **(04 Marks)**

7 a. Define the following terms in an optical fibre link related equations: **(06 Marks)**
i) Receiver sensitivity ii) Maximum usable length iii) Pulse spread.

b. What is meant by 'WDM systems'? Explain with a related diagram. **(07 Marks)**

c. What is meant by 'optical cross-connects'? Explain with a related diagram. **(07 Marks)**

8 Write short notes on: **(20 Marks)**

a. PNNI routing b. Throughput of TCP

b. Multi hop-LAN d. Digital subscriber line (DSL)

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06EC841

Eighth Semester B.E. Degree Examination, May/June 2010
Multimedia Communications

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. With the help of a diagram, describe the main components of PSTN, and show how a high – speed modem provides multiple services in addition to basic telephony. **(10 Marks)**

b. Explain the working of CO packet switched network including routing table. **(08 Marks)**

c. Briefly explain the following operational modes of a communication channel :
i) Duplex ; ii) Multicast. **(02 Marks)**

2 a. Explain the principle of operation of a PCM speech codec, with a block diagram. **(06 Marks)**

b. Find out the time taken to transmit the following digitized images at both 64 Kbps and 1.5 Mbps.
i) a 640 x 480 x 8 VGA compatible image
ii) a 1024 x 768 x 24 SVGA compatible image. **(04 Marks)**

c. With the aid of diagrams describe the following digitization formats : i) 4 : 2 : 2 ; ii) QCIF. For each format, state the temporal resolution, spatial resolution, bit rate and give an example application of each format. **(10 Marks)**

3 a. A series of messages is to be transmitted between computers over a PSTN. The messages comprise the characters A through H. The probability of each character is as follows :
A and B = 0.25 C and D = 0.14 E, F, G and H = 0.055.
i) Use Shanon's formula to derive the minimum average number of bits/character.
ii) Use Huffman coding to derive the codeword and prove that this is the minimum set by constructing the corresponding Huffman code tree. **(14 Marks)**

b. With the help of a block diagram, identify the five main stages associated with the baseline mode of operation of JPEG encoder and give a brief description of the role of image/block preparation. **(06 Marks)**

4 a. Explain how better sound quality can be obtained using subband coding ADPCM, with the help of block diagrams and signal encoder and signal decoder. **(10 Marks)**

b. Draw the block diagram of H.261 video encoder and explain the role of FIFO buffer and the associated high and low threshold values. **(10 Marks)**

PART – B

5 a. In relation to the spanning tree algorithm, explain the meaning of the following terms:
i) Root bridge
ii) Designated cost
iii) Root path cost and root port
iv) Designated bridge and designated port. **(10 Marks)**

b. Explain the principle of operation of a token ring network, with the help of a diagram. **(10 Marks)**

6 a. With respect to IP datagram/packet format, explain the role of the following header fields.
   i) IHL
   ii) TOS
   iii) Total length
   iv) Flag bits. **(08 Marks)**

   b. What is the meaning of IP address class? With the help of a diagram, explain the different types of IP address formats. **(08 Marks)**

   c. Explain how RARP is used to enable a diskless host to determine its own IP address from its local server. **(04 Marks)**

7 a. With the help of a diagram, explain broadband ATM cell formats. **(10 Marks)**

   b. Explain the general structure of ATM switch architecture. **(10 Marks)**

8 a. Explain the meaning of the following terms in relation to the operation of TCP :
   i) Reliable stream service
   ii) Segment
   iii) Maximum segment size.
   State why both flow control and congestion control procedures are required with TCP. **(08 Marks)**

   b. With the aid of a diagram, explain briefly UDP datagram header fields. **(04 Marks)**

   c. In relation to the RTP packet format, explain briefly the meaning and use of the following fields :
   i) CC and CSRC
   ii) M and payload type
   iii) Sequence number. **(08 Marks)**

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