VIII EC, EE Ⓢ

USN | | | | | | | | | | **10EC82**

Eighth Semester B.E. Degree Examination, June/July 2015
Digital Switching System

Time: 3 hrs.   Max. Marks:100

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

PART – A

1   a. With a neat diagram of a four wire circuit connected to two wire circuit through a hybrid transformer and equation for line attenuation, explain singing and two types of echo's. **(10 Marks)**

    b. Calculate the total bit rate for a 30 channel PCM system and draw figure for the same with all the details included. Also show calculations for the frame length. **(10 Marks)**

2   a. Differentiate between circuit switching and message switching. **(06 Marks)**

    b. With a neat block diagram, explain subscribers line interface circuit for a digital switch. **(07 Marks)**

    c. With the help of a neat diagram, explain the intra LM call and inter LM call processing. **(07 Marks)**

3   a. Derive an expression for the second Erlang's distribution starting from basic principles. **(10 Marks)**

    b. Calculate $E_{2,N}(A)$ from $E_{1,N}(A)$. **(06 Marks)**

    c. A group of 20 trunks provide a GOS of 0.01 when offered 12E traffic.
       i)   How much GOS is improved if one extra is added to the group?
       ii) How much does the GOS deteriorate if one trunk is out of service? **(04 Marks)**

4   a. Design a progressive grading system connecting 20 outgoing trunks and having switches with availability of 10. Draw the grading diagram. **(10 Marks)**

    b. Design a three-stage network for 100 incoming trunks to 400 outgoing trunks. Draw the diagram. **(10 Marks)**

PART – B

5   a. With a neat diagram, explain the operation of a time switch and discuss its limitations. Also illustrate how a S-T or T-S switch overcome these limitations. **(12 Marks)**

    b. Explain synchronization and frame alignment of PCM signals in digital exchange. **(08 Marks)**

6   a. With neat diagram explain level 1, level 2 and level 3 control of a digital switching system. **(10 Marks)**

    b. What are feature flow diagram? Draw feature flow diagram for feature activation, feature operation and feature deactivation for a call forwarding feature. **(10 Marks)**

7   a. With a neat block diagram, explain organizational interfaces of a digital switching system central office. **(10 Marks)**

    b. Explain system outage and its impact on digital switching system reliability. **(10 Marks)**

8   a. Explain the three level scheme of recovery strategy in a digital switch. **(06 Marks)**

    b. Write the common characteristics of digital switching system. **(06 Marks)**

    c. Explain with a neat diagram, a generic switch hardware and software architecture. **(08 Marks)**

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10EC832

Eighth Semester B.E. Degree Examination, June/July 2015
Network Security

Time: 3 hrs.

Max. Marks:100

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

PART – A

1 a. Explain X·800 security mechanisms, in detail. **(10 Marks)**
   b. Differentiate between active and passive attacks. **(04 Marks)**
   c. In S –DES, 10 bit key is 1011010011 find the sub keys k_1 and k_2 if :
   $P_{10} = 35274101986$; $P_8 = 637485109$. **(06 Marks)**

2 a. Decrypt the cipher text "CQSUBJNR" using Hill cipher technique with the key :
   $\begin{bmatrix} 7 & 8 \\ 19 & 3 \end{bmatrix}$. Find the plain text [Hint : a = 0, b = 1, - - - - - z = 25]. **(10 Marks)**
   b. How are the disadvantages of ECB mode of operation overcome in the CBC mode of operation? **(10 Marks)**

3 a. Perform encryption and decryption using RSA if p = 7, q = 11, e = 13 and M = 5. **(08 Marks)**
   b. Explain the public key distribution of secret key with confidentiality and authentication. **(04 Marks)**
   c. With neat schematics, explain message authentication code. **(08 Marks)**

4 a. What is a digital signature? List the properties and requirements of digital signature. **(10 Marks)**
   b. Discuss the various approaches of one – way authentication protocol. **(10 Marks)**

PART – B

5 a. What are the services provided by SSL record protocol for SSL connections? Explain overall operation of SSL record protocol. **(10 Marks)**
   b. List and explain the SET participants with neat diagram. **(10 Marks)**

6 a. Explain the techniques used for intrusion. **(06 Marks)**
   b. Write short notes on honey pots. **(04 Marks)**
   c. Explain password selection strategies in detail. **(10 Marks)**

7 a. Write short notes on Trojan horses. **(05 Marks)**
   b. Explain the various phases that a virus undergoes during its life time. **(05 Marks)**
   c. Discuss the two most important advanced antivirus techniques. **(10 Marks)**

8 a. List and explain the different attacks on packet filtering routers along with appropriate counter measures. **(10 Marks)**
   b. Explain briefly the concept of trusted systems. **(10 Marks)**

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10EC834/TE835

Eighth Semester B.E. Degree Examination, June/July 2015
High Performance Computer Networks

Time: 3 hrs.

Max. Marks:100

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

PART – A

1 a. What is meant by :
    i) Service integration
    ii) Network externalities
    iii) Economics of scale. Explain. **(10 Marks)**
  b. Write note on :
    i) Pure ATM. **(04 Marks)**
    ii) Cable television network. **(06 Marks)**

2 a. Explain layered architecture. **(06 Marks)**
  b. What are the bottlenects of network? **(08 Marks)**
  c. Give comparision between connection oriented and connectionless service. **(06 Marks)**

3 a. Explain FTP and SMTP, TFTP and HTTP. **(10 Marks)**
  b. Explain window adjustment in TCP with suggested improvement for TCP. **(10 Marks)**

4 a. Explain intelligent network architecture. Given the functional components. **(10 Marks)**
  b. Explain SONET frame structure. **(10 Marks)**

PART – B

5 a. Mention features of ATM. **(04 Marks)**
  b. Explain signaling and PNNI routing. **(10 Marks)**
  c. Explain ATM adaption layers. **(06 Marks)**

6 a. Explain cellular telephone systems. **(10 Marks)**
  b. Explain home RF and Blue tooth. **(04 Marks)**
  c. Explain different architecture of wireless network. **(06 Marks)**

7 a. Explain M|M|1 queue and Jackson network. **(10 Marks)**
  b. Write note on :
    i) Internet service providers
    ii) Empirical evidence. **(10 Marks)**

8 a. Describe about single hop and multihop optical LANs. **(10 Marks)**
  b. With a neat diagram, explain WDM systems. **(05 Marks)**
  c. Mention the functions of Add/drop multiplexer, switch and optical cross connect with reference to optical networking. **(05 Marks)**

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10EC/TE841

Eighth Semester B.E. Degree Examination, June/July 2015
Multimedia Communications

Time: 3 hrs.   Max. Marks:100

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

PART – A

1	a.	What is multimedia? Explain its applications?	(08 Marks)
	b.	With diagram explain different types of multimedia networks.	(12 Marks)
2	a.	Explain clearly different types of text data representation.	(08 Marks)
	b.	With schematic diagram, explain PCM signal encoding and decoding principles.	(12 Marks)
3	a.	Explain clearly about image encoding and decoding methods with diagram.	(14 Marks)
	b.	Explain Huffman coding procedure for encoding any given data.	(06 Marks)
4	a.	What is the role of DCT and quantization in video compression?	(08 Marks)
	b.	Explain perceptual coding technique with diagram.	(08 Marks)
	c.	Explain aspect ratio?	(04 Marks)

PART – B

5	a.	Explain the operation of token ring network.	(10 Marks)
	b.	Explain the LAN protocols.	(10 Marks)
6	a.	With example explain fragmentation and reassembly in the internet.	(10 Marks)
	b.	Explain clearly datagram format of IPv6.	(10 Marks)
7	a.	With the help of diagram, explain broadband ATM cell formats.	(10 Marks)
	b.	Explain LAN emulation in ATM.	(10 Marks)
8	a.	Explain RTP and RTCP protocols.	(10 Marks)
	b.	Explain TCP and UDP protocols.	(10 Marks)

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Eighth Semester B.E. Degree Examination, June/July 2015
Real Time Operating System

Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Write the state machine diagram, for real time service using polling and explain how it is different from event driven service. Write the algorithms for both the cases.   **(12 Marks)**

   b. With diagrams, explain all the parts in a real time service timeline with and without hardware acceleration.   **(08 Marks)**

2 a. Write thread state transition table and state transition diagram with five possible states. Also write the thread state reentrant function with task lock and unlock functions. What happens if these two functions are removed for a satellite application function?   **(12 Marks)**

   b. With diagram and an example, explain hard RTS, isochronal RTS, soft RTS and soft isochronal RTS utility graphs.   **(08 Marks)**

3 a. Describe preemptive fixed priority policy using RM with an example and equation of RMLUB. Derive RMLUB equation considering the two critical cases with timing diagrams and relationship graphs for T_1 and T_2.   **(12 Marks)**

   b. Explain deadline monotonic policy with equations and illustrate if $D_i = T_i$, $T_1 = 2$ $T_2 = 5$, $C_1 = 1$ and $C_2 = 1$. How does DM differ from RM policy?   **(08 Marks)**

4 a. Explain ECC memory design using hamming code. The data byte is $(11000100)_2$. Write tables and calculations for forming encoded data and for the corrected data. Write the calculation and correction if do_5 is changed during transmission.   **(12 Marks)**

   b. Write the equations and conditions for WCET and ACET for hard and soft real time systems respectively. Also list the five conditions for CPU and I/O overlap situation for deadline D_i.   **(08 Marks)**

PART – B

5 a. Determine individual utilization, total utilization and RMLUB, if $T_1 = 3$, $T_2 = 5$, $T_3 = 15$, $C_1 = 1$, $C_2 = 2$, $C_3 = 3$. Write the timing diagram for RM, EDF and LLF scheduling policies, for 15 time units. Write the calculations and the analysis for all the three policies. **(12 Marks)**

   b. Explain the terms blocking, deadlock, livelock and critical section with examples. **(08 Marks)**

6 a. Define the functions of the three firmware components. Also write an application program for synchronizing two tasks using semaphore and delay functions.   **(12 Marks)**

   b. Explain exception and assert with programming examples.   **(08 Marks)**

7 a. Explain how path length, efficiency and CPI can be estimated by considering a sample C code to compute Fibonacci sequence. Consider the suitable platform and the tools that are used for these.   **(12 Marks)**

   b. Explain the four basic methods to build performance monitoring capability into hardware.   **(08 Marks)**

8 a. Describe reliability and availability with equation, diagrams and examples.   **(10 Marks)**

   b. Explain the design issues for process and memory management in the RTOS design for a PIC microcontroller.   **(10 Marks)**

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Eighth Semester B.E. Degree Examination, June/July 2015

AD-HOC Wireless Networks

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 various differences between cellular networks and ad-hoc wireless networks.
                                                                                        (10 Marks)
    b.   Give the schematic diagram of ad-hoc wireless internet and also explain the major issues in ad-hoc wireless internet.   **(10 Marks)**

2   a.   Explain the various design goals of a MAC protocol for ad-hoc wireless networks.
                                                                                        (10 Marks)
    b.   Explain the various MAC protocols. Also give the classification tree for the same. **(10 Marks)**

3   a.   Explain the operation of a DMAC protocol and also mention its advantages.   **(10 Marks)**
    b.   Explain distributed priority scheduling scheme (DPS) used in wireless ad-hoc networks with a neat diagram.   **(10 Marks)**

4   a.   With necessary diagrams, explain Route establishment and route maintenance mechanisms in associativity based routing protocol.   **(10 Marks)**
    b.   With a classification tree, explain the various classifications of routing protocols used in wireless ad-hoc networks.   **(10 Marks)**

PART – B

5   a.   Explain the important routing metrics considered in power-aware routing protocols.
                                                                                        (10 Marks)
    b.   Explain with a neat diagram, optimized link state routing protocol.   **(10 Marks)**

6   a.   Explain the various goals to be met while designing a transport layer protocol for ad-hoc wireless networks.   **(10 Marks)**
    b.   Explain the various issues which are considered while designing a transport layer protocol.
                                                                                        (10 Marks)

7   a.   Explain the issues and challenges in security provisioning in ad-hoc wireless networks.
                                                                                        (10 Marks)
    b.   Explain the various requirements a security protocol for ad-hoc wireless networks should meet.   **(10 Marks)**

8   a.   Explain the various challenges and issues in providing QoS in ad-hoc wireless networks.
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    b.   Give the classification tree of QoS solutions in ad-hoc wireless networks based on:
         i)   Layer at which they operate
         ii) QoS approach employed.   **(10 Marks)**

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