USN | | | | | | | | | | |

10EC81

Eighth Semester B.E. Degree Examination, June/July 2014

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. With an appropriate diagram, explain the OSI model. How does it relate to communication network? **(10 Marks)**

b. Describe the characteristics of 1G, 2G and 3G cellular system. How do 2G cellular system support more than one user per channel? **(10 Marks)**

2 a. Draw the neat block diagram of common cellular system and explain the base station system (BSS) components. **(10 Marks)**

b. With neat flow diagram, explain the mobile terminated call operation. **(10 Marks)**

3 a. Explain the following capacity expansion techniques:
i) Cell splitting
ii) Cell sectoring
iii) Overlaid cells **(10 Marks)**

b. Explain the power control and power saving schemes in cellular system. **(10 Marks)**

4 a. With a neat GSM network architecture, explain the network switching system (NSS). **(10 Marks)**

b. With suitable diagram, explain the GSM channel concept. **(10 Marks)**

PART – B

5 a. List the different call setup operations and with flow diagram explain interrogation phase and IMEI check operation. **(10 Marks)**

b. With neat flow diagram, explain GSM inter BSC handover operation. **(10 Marks)**

6 a. With a neat block diagram, explain the generation of CDMA forward traffic channel. **(10 Marks)**

b. Explain the CDMA mobile originated timeline. **(10 Marks)**

7 a. With neat diagram, explain 4-psk modulation technique. **(10 Marks)**

b. Explain the following:
i) Path loss model
ii) Block interleaving **(10 Marks)**

8 a. What are the IEEE 802.11 extensions? **(06 Marks)**

b. With suitable diagram, explain the Bluetooth piconet architecture. **(07 Marks)**

c. With suitable diagram explain the Bluetooth system components. **(07 Marks)**

* * * * *

USN | | | | | | | | | | |

10EC832

Eighth Semester B.E. Degree Examination, June / July 2014
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. Distinguish between passive and active attacks. **(04 Marks)**

b. Explain the different categories of security services. **(06 Marks)**

c. Draw the block diagram of network security model and explain it. Mention basic tasks in designing a particular security service. **(10 Marks)**

2 a. Encrypt the plain text "PAY MORE MONEY" using Hill Cipher with the key.

$$\text{Key} = \begin{bmatrix} 17 & 17 & 5 \\ 21 & 18 & 21 \\ 2 & 2 & 19 \end{bmatrix}$$

Show the calculations and cipher text. **(10 Marks)**

b. Draw the single round DES algorithm and explain the process in detail. **(10 Marks)**

3 a. In a RSA algorithm system it is given that p = 3, q = 11, e = 7 and M = 5. Find the cipher text 'C' and decrypt 'C' to get plaintext M. **(06 Marks)**

b. Explain Diffie-Hellman key exchange algorithm with example. **(06 Marks)**

c. What is key management? Explain distribution of secret key using public key cryptography. **(08 Marks)**

4 a. Explain arbitrated digital signatures technique. **(08 Marks)**

b. With neat diagram, explain digital signature algorithm. **(08 Marks)**

c. Illustrate replay attacks. **(04 Marks)**

PART – B

5 a. Draw the block diagram of handshake protocol action and explain it. **(08 Marks)**

b. Explain in detail: i) Purchase request ii) Payment authorization transaction supported by Secure Electronic Transaction (SET). **(08 Marks)**

c. List the features of secure socket layer. **(04 Marks)**

6 a. What are the different types of intrusion detection system and explain it? **(10 Marks)**

b. Mention the advantages and disadvantages of signature-based detection. **(04 Marks)**

c. Explain the password selection strategies. **(06 Marks)**

7 a. Briefly describe the types of viruses. **(08 Marks)**

b. With a neat diagram, explain digitial immune system. **(08 Marks)**

c. Difference between worm and virus. **(04 Marks)**

8 a. What are the different types of firewall and explain packet filtering router in detail? **(10 Marks)**

b. What are the different firewall configurations and explain it? **(10 Marks)**

* * * * *

USN | | | | | | | | | | |

10TE835/10EC834

Eighth Semester B.E. Degree Examination, June / July 2014
High Performance Computer Networks

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 meant by economics of scale, network externalities and service integration? **(09 Marks)**

b. Discuss about computer network with relevant diagrams. **(08 Marks)**

c. A telephone network transmits a frequency of 4 kHz and SNR is 48 dB. Find i) Sampling rate ii) Number of bits per sample iii) Bit rate of the signal. **(03 Marks)**

2 a. Specify verious network mechanisms. Explain Go-Back N protocol in detail. **(09 Marks)**

b. Explain the layered architecture of network functions and its implementation. **(08 Marks)**

c. Calculate the time required to transmit a packet size of 10000 bit with a transmission speed of 1 Mbps and processing delay of 4×10^{-6} s. **(03 Marks)**

3 a. State limitation of IPV4 and explain IPV6. **(10 Marks)**

b. Explain window adjustment technique in TCP. **(05 Marks)**

c. Explain TCP header. **(05 Marks)**

4 a. Draw a SONET frame and explain. **(10 Marks)**

b. Explain DWDM. **(05 Marks)**

c. Discuss the intelligent network architecture. **(05 Marks)**

PART – B

5 a. Explain the following with respect to ATM network: i) Features of ATM ii) QOS parameters iii) Types of delay iv) Signalling. **(12 Marks)**

b. Explain ATM adaptation layer. **(08 Marks)**

6 a. Discuss multiple access and random access techniques. **(08 Marks)**

b. Write notes on: i) architecture in wireless ii) blue tooth iii) coding and interleaving. **(12 Marks)**

7 a. What is datagram network? Discuss datagram network's queuing model and key queuing result with suitable diagram. **(08 Marks)**

b. Explain and discuss : i) Time scales ii) Routing optimization iii) ISP. **(12 Marks)**

8 Write short notes on :

a. Optical fiber.

b. WDM.

c. Single hop LAN's.

d. Optical cross connect. **(20 Marks)**

* * * * *

USN | | | | | | | | | | |

10EC/TE841

Eighth Semester B.E. Degree Examination, June / July 2014
Multimedia Communication

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. List the five basic of communication network that are used to provide multimedia services. Explain with a neat diagram, i) Broadcast television network ii) Integrated service digital network. **(12 Marks)**

b. Explain with neat diagram of multipoint conferencing modes and types of conferencing. **(08 Marks)**

2 a. With the aid of a diagram, explain how a color image is captured within a camera scanner using each of the following methods:
i) Single image sensor.
ii) A single image sensor with filters.
iii) Three separate image sensors. Include in your explanantions the term "photosities and 'CCD's and the role of the readout register. **(10 Marks)**

b. Derive the bit rate and the memory requirements to store each frame that results from the digitization of both a 525 line and 625 line system, assuming a 4 : 2 : 0 format. Also find the total memory required to store a 2 hour movie / video. **(10 Marks)**

3 a. Initially a dictionary containing only three characters with code as follows:

Code	String
1	X
2	Y
3	Z

Now if the input string is XYXYYXYZXYXYYX. Use LZW compression algorithm, find the output code. Also show that it is truly lossless algorithm by using LZW decoder. **(10 Marks)**

b. Explain the following with neat diagram,
i) Image / block preparation. ii) Forward DCT. **(10 Marks)**

4 a. With the help of a neat diagram, explain LPC encoder and decoder. **(10 Marks)**

b. Explain H.261 encoding formats. **(10 Marks)**

PART – B

5 a. What is transparent bridge? With a neat diagram, explain transparent bridge architecture and its application example. **(10 Marks)**

b. Explain in detail token ring network frame formats and field description. **(10 Marks)**

6 a. Explain with a neat diagram, IP adjunct protocol. **(10 Marks)**

b. Explain IPV6 datagram format. **(10 Marks)**

7 a. Explain ATM adaption layer 1 & 2 with neat format. **(10 Marks)**

b. Explain with a schematic diagram of ATM LAN. **(10 Marks)**

8 a. Explain TCP / IP protocol suite with a neat diagram. **(10 Marks)**

b. Write a short note on:
i) Real time transport protocol (RTP).
ii) Real time transport control protocol (RTCP). **(10 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.

USN | | | | | | | | | | |

10EC842

Eighth Semester B.E. Degree Examination, June/July 2014
Real Time Operating Systems

Time: 3 hrs. Max. Marks:100

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

PART – A

1 a. Define real-time system. Write and explain a pseudocode outline of a basic event-driven software service. **(12 Marks)**

b. List the important features that are required to be supported by a RTOS. **(08 Marks)**

2 a. With diagrams explain hard real time, isochronal real time and soft isochronal real time service utilities. **(12 Marks)**

b. With state transition diagram, explain the functions of the various service states. **(08 Marks)**

3 a. Define RM Least Upper Bound (RMLUB), calculate the 'utility of the cpu resource achievable' for the following system of tasks:
i) $T_1 = 2,\ T_2 = 5,\ C_1 = 1,\ C_2 = 1$ ii) $T_1 = 2,\ T_2 = 5,\ C_1 = 1,\ C_2 = 1$. **(08 Marks)**

b. With reference to RMLUB explain relationship between sufficient and necessary and sufficient conditions for feasibility tests. **(06 Marks)**

c. With diagram explain RM and EDF policy overload scenario. **(06 Marks)**

4 a. Explain a simple pipeline with an example of stage overlap depth = 4. **(06 Marks)**

b. Explain physical memory hierarchy in hardvard architecture and how it is logically partitioned and segmented by the firmware. **(08 Marks)**

c. Discuss different types of cache mapping. **(06 Marks)**

PART – B

5 a. Write scheduling diagram for the following tasks to illustrate "DM policy succeeds when RM would fail": **(10 Marks)**

$T_1 = 2$	$C_1 = 1$	$D_1 = 2$
$T_2 = 5$	$C_2 = 1$	$D_2 = 3$
$T_3 = 2$	$C_3 = 1$	$D_3 = 7$
$T_4 = 13$	$C_4 = 2$	$D_4 = 15$

b. Explain priority inversion in the context of real-time scheduling. Briefly explain how this problem can be overcome. **(10 Marks)**

6 a. With a block diagram, explain different substem of stereo-vision tracking system. **(10 Marks)**

b. Explain the features of high speed and low speed serial bus interconnection. **(10 Marks)**

7 a. What are exceptions, assert and single step debugging? How are they used? **(08 Marks)**

b. Differentiate between hardware and software break points. **(06 Marks)**

c. Explain test access ports and trace ports. **(06 Marks)**

8 a. Discuss similarities and differences of reliability and availability. **(06 Marks)**

b. Write a short note on performance tuning. **(06 Marks)**

c. Explain with diagram flash programming in PIC16F8X IC's. **(08 Marks)**

* * * * *

USN | | | | | | | | | | |

10EC843

Eighth Semester B.E. Degree Examination, June/July 2014
GSM

Time: 3 hrs. Max. Marks:100

Note: ***1. Answer any FIVE full questions, selecting atleast TWO questions from each part.***
2. Use of Erlang's table is permitted.

PART – A

1 a. With a reference model, explain GSM sub system entities and logical interconnection. **(08 Marks)**

b. With a neat block diagram, explain the mapping of GSM layers onto the OSI layer. **(07 Marks)**

c. List and explain the GSM interfaces. **(05 Marks)**

2 a. What are the future techniques available to reduce interference in GSM? Explain. **(08 Marks)**

b. Explain radio link features of GSM. **(06 Marks)**

c. List the various signal level and quality level values in GSM. **(06 Marks)**

3 a. Explain different types of GSM burst frames. **(08 Marks)**

b. With the help of handshaking signals, explain the mobile identification process in GSM. **(04 Marks)**

c. Discuss the mobility management process in GSM. **(08 Marks)**

4 a. List and explain the speech codec attributes. **(10 Marks)**

b. What are GSM vocoders? Also explain types of vocoders. **(10 Marks)**

PART – B

5 a. Explain the GSM call terminated by an M.S. flow scenario. **(10 Marks)**

b. With a neat block diagram, explain the GSM GPRS. **(10 Marks)**

6 a. What are the wireless security requirements in GSM? **(08 Marks)**

b. Explain different types of security algorithms used for GSM. **(06 Marks)**

c. Write a note on token based authentication. **(06 Marks)**

7 a. Use the following data for a GSM S/M
Subscriber usage per month = 120 minutes
Days per month = 24
Busy hours per day = 5
Allocated spectrum = 5MHz
Frequency reuse plan = 4/12
RF channel width = 200kHz, full rate
Capacity of a BTS = 32 Erlang's
Subscribers in the zone = 60,000
Area of the zone = 500km^2.
Calculate:
i) Average busy-hour traffic per subscriber
ii) Traffic capacity per cell
iii) Required number of BS's per zone and the hexagonal cell radius for the zone. **(08 Marks)**

b. List out the criteria's required for a wireless system design. **(06 Marks)**

c. What are the factors considered in selecting modulation schemes in TDMA for GSM? **(06 Marks)**

8 a. Explain the five management functional areas for a TMN services. **(10 Marks)**

b. List out and explain the TMN layers in M.3010. **(06 Marks)**

c. Write a note on SNMP. **(04 Marks)**

* * * * *

USN | | | | | | | | | | |

10EC844/10TE845

Eighth Semester B.E. Degree Examination, June / July 2014
Adhoc 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. Discuss the major issues to be considered for a successful adhoc wireless internet. **(10 Marks)**

b. Explain any five differences between cellular network and adhoc network. **(10 Marks)**

2 a. Explain any five issues to be considered while designing a MAC protocol for adhoc wireless networks. **(10 Marks)**

b. Explain the classification of MAC protocols. **(06 Marks)**

c. Explain how synchronization is achieved among the nodes in Hop reservation multiple access protocol. **(04 Marks)**

3 a. Explain distributed priority scheduling MAC protocol. **(10 Marks)**

b. Discuss directional MAC (D-MAC) protocol using DMAC-1 and DMAC-2 mechanisms. **(10 Marks)**

4 a. Explain cluster head gateway switch routing protocol (CGSR). Mention any two advantages and disadvantages of CGSR protocol. **(10 Marks)**

b. With an example, explain the process of route establishment in adhoc on-demand distance - vector (AODV) routing protocol. **(10 Marks)**

PART – B

5 a. Explain any one hierarchical routing protocol. **(10 Marks)**

b. Discuss zone routing protocol with the help of an example. **(10 Marks)**

6 a. Discuss the issues and design goals of a transport layer protocol for adhoc wireless networks. **(10 Marks)**

b. Explain Feedback-based trasnsport control protocol. **(10 Marks)**

7 a. Explain the various network layer attacks in adhoc wireless networks. **(10 Marks)**

b. Discuss the issues and challenges in security provisioning for adhoc wireless networks. **(06 Marks)**

c. Briefly explain shamir's three pass protocol for key management in adhoc wireless networks. **(04 Marks)**

8 a. Give the classification of QOS solutions for adhoc wireless networks. **(10 Marks)**

b. Explain the access procedure and bandwidth reservation mechanism in DBASE protocol for MAC layer QOS. **(10 Marks)**

* * * * *