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Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016
Wireless Communication

Time: 3 hrs.　　　　　　　　　　　　　　　　　　　　　　Max. Marks:100

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

PART – A

1　a. Describe AMPS mobile phone initialization steps, with neat time diagram. **(10 Marks)**
　　b. Describe AMPS handoff operation, with neat diagram showing the time sequences of events, signals and messages used. **(10 Marks)**

2　a. Draw a neat diagram, showing typical wireless system components and describe each component in brief. **(12 Marks)**
　　b. Draw and explain the structure of MSISDN, IMSI and IMEI identification numbers. **(08 Marks)**

3　a. Explain with relevant diagrams, how cell splitting and cell sectoring enable capacity expansion. **(10 Marks)**
　　b. Explain how Radio Resource Management and Power Management are done in Wireless Communication Systems. **(10 Marks)**

4　a. Classify and name GSM logical channels and explain their major functions. **(10 Marks)**
　　b. Draw and describe the structure of TDMA frame, multiframe, superframe and hyperframe. Specify their time lengths. **(10 Marks)**

PART – B

5　a. Explain Authentication and Ciphering mode setting. Operations in GSM call setup operation with relevant flow diagrams. **(12 Marks)**
　　b. Explain Intra BSC Handover in GSM, with neat figure. **(08 Marks)**

6　a. Explain Network Nodes in CDMA 2000 wireless system, with neat diagram. **(12 Marks)**
　　b. Explain spectrum spreading operation in CDMA channels. **(08 Marks)**

7　a. Discuss various coding techniques used in wireless communication. **(12 Marks)**
　　b. Discuss various path loss models. **(08 Marks)**

8　a. Draw and describe Frame structure for general and management MAC frame format in 802.11. Also explain the 2 byte control field. **(12 Marks)**
　　b. Draw and explain typical piconet and scatter net in Bluetooth. How one device can act as both master and slave in scatternets? **(08 Marks)**

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Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016
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. Explain briefly with neat diagram, the national telecommunication network. **(08 Marks)**
   b. Explain the principle operation of a four wire circuit with neat diagram. **(08 Marks)**
   c. Explain the following power levels in dBm and dBW i) 1 mW ii) 1W iii) 2mW iv) 100 mW. **(04 Marks)**

2 a. Explain message switching and circuit switching bring out the difference between them. **(07 Marks)**
   b. Define traffic. List different functions of switching system. **(06 Marks)**
   c. Explain the working of basic central office Linkages. **(07 Marks)**

3 a. Define the following terms : i) the unit of traffic ii) grade of service(GOS) ii) congestion iv) busy hour v) holding time. **(05 Marks)**
   b. During the busy hour a group of trunks is offered 100 calls having an average duration of 3 minutes one of the call fails to find a designated trunk. Find the traffic offered to the group, traffic carried by the group and the traffic lost. **(05 Marks)**
   c. Derive an expression for iterative form of Erlang's lost call formula with explanation of assumptions mode. **(10 Marks)**

4 a. Obtain the expression for minimum number of cross points for a two stage network with N number of in –coming trunks and N number of outgoing trunks and also draw two stage switching network. **(08 Marks)**
   b. Explain traffic capacity of gradings with a curve (graph), traffic in Erlangs(A) V/S number of trunks required (N). **(06 Marks)**
   c. Design a progressive grading for connecting 20 trunks to switches having ten outlets. **(06 Marks)**

PART – B

5 a. Explain the principle operation of T-S-T network and S-T-S network. **(08 Marks)**
   b. Explain with block diagram the frame alignment of PCM signal in digital exchange. **(06 Marks)**
   c. A T-S-T network has 20 incoming and 20 outgoing PCM highway each conveys 30 channels, the required GOS is 0.01, 0.02. Find the traffic capacity of network in mode 1 and mode 2. **(06 Marks)**

6 a. Explain in brief digital switching system software classification. **(10 Marks)**
   b. With the help of feature flow diagram, explain feature activation, feature operation and feature de – activation. **(10 Marks)**

7 a. Explain briefly with neat diagram of organizational interfaces of a typical digital switching system central office. **(10 Marks)**
   b. With block diagram, explain the strategy used for improvement of software quality. **(10 Marks)**

8 a. Explain with block diagram, a generic switch software architecture. **(08 Marks)**
   b. Mention some common characteristics of digital switching system. **(05 Marks)**
   c. Write a short note on analysis report of a digital switching system. **(07 Marks)**

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Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016
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. With a neat block diagram, discuss the functioning of network security model. List four basic tasks of designing security model. **(10 Marks)**
   b. Encrypt the message "ELECTRONICS" using playfair cipher with a key "INDIA". Also, give the rules for encryption. **(10 Marks)**

2 a. Encrypt the plain text "HAND" using hill cipher with the key
$$key = \begin{vmatrix} 5 & 8 \\ 17 & 3 \end{vmatrix}$$
   Also decrypt it and verify the encryption and decryption text. **(10 Marks)**
   b. In S – DES, 10 – bit key is "1010000010". Find the sub keys k_1 and k_2. If
$$P_{10} = \quad 3 \quad 5 \quad 2 \quad 7 \quad 4 \quad 10 \quad 1 \quad 9 \quad 8 \quad 6$$
$$P_8 = \quad 6 \quad 3 \quad 7 \quad 4 \quad 8 \quad 5 \quad 10 \quad 9$$
(10 Marks)

3 a. In a RSA algorithm system, the cipher text received is C = 10 with a public key P_U = {5, 35}, deduce the plain text. Verify the answer by encryption process. **(10 Marks)**
   b. Explain Diffie – Hellman key exchange algorithm. Also calculate the Y_A, Y_B and secret key (k) for q = 23, α = 07, X_A = 3 and X_B = 6. **(10 Marks)**

4 a. Write a short note on Hash function. **(05 Marks)**
   b. Mention the requirements for a digital signature. **(05 Marks)**
   c. Explain the signing and verifying functions of digital signature algorithm (DSA). **(10 Marks)**

PART – B

5 a. Explain the SSL architecture. **(10 Marks)**
   b. Highlight the key features of SET. **(05 Marks)**
   c. Explain in detail, the payment capture transaction supported by SET. **(05 Marks)**

6 a. Explain the architecture of a distributed intrusion detection system. Give the major issues in the design. **(10 Marks)**
   b. Briefly explain the password selection strategies. **(10 Marks)**

7 a. Give the taxonomy of malicious programs and explain in brief. **(10 Marks)**
   b. With a schematic, explain the typical step in digital immune system. **(10 Marks)**

8 a. With a neat diagram, explain the concept of trusted systems. **(10 Marks)**
   b. What is firewall? Mention the capabilities and limitations of firewalls. **(10 Marks)**

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Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016
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 out the different multimedia networks and explain telephone networks and broadcast television network using cable with relevant diagrams. **(10 Marks)**
   b. With neat diagram, explain multipoint conferencing modes of operation. **(07 Marks)**
   c. Determine the propagation delay associated with the following communication channels given velocity of propagation for case (i) and (ii) as 2×10^8 m/s and (iii) 3×10^8 m/s.
      i) a connection through a private telephone network of 1 km.
      ii) a connection through a PSTN of 200 km
      iii) a connection over a satellite channel of 50000 km. **(03 Marks)**

2. a. With the aid of a diagram, explain color image capture using camera and also RGB signal generation methods for the above. **(10 Marks)**
   b. With the aid of a diagram, explain audio/sound synthesizer. **(07 Marks)**
   c. Derive the memory required to store a 10 minute passage of stereophonic music. Assume bandwidth of music is 15 Hz through 20 kHz and Nyquist rate is 16 bits per sample. **(03 Marks)**

3. a. Explain with a neat diagram JPEG encoder. **(10 Marks)**
   b. Encode the string went comprising characters with probability of e = 0.3, n = 0.3, t = 0.2, w = 0.1, • = 0.1 using arithmetic coding. **(10 Marks)**

4. a. Explain with a diagram ADPCM subband encoder and decoder. **(10 Marks)**
   b. Explain with diagram H.263 error tracking. **(10 Marks)**

PART – B

5. a. With the aid of a diagram, explain transparent bridge and give an example. **(10 Marks)**
   b. Explain with diagrams FDDI networking components and interface. **(10 Marks)**

6. a. Explain IP datagram/packet format and header fields. **(10 Marks)**
   b. What is QoS support for internet applications? Explain the control mechanism used in each class to meet QoS requirement. **(10 Marks)**

7. a. With relevant diagrams explain two types of routing in ATM network and also explain general structure of ATM switch. **(10 Marks)**
   b. Explain LAN emulation in ATM and also unicast protocol architecture with relevant diagrams. **(10 Marks)**

8. a. Explain TCP connection establishment with the aid of a diagram (only client server). **(10 Marks)**
   b. With the aid of a diagram, explain congestion control and avoidance for TCP (only diagram for congestion control). **(10 Marks)**

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10EC842

Eighth Semester B.E. Degree Examination, Dec.2015/Jan.2016
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. Explain briefly the real time systems with two examples. **(10 Marks)**
   b. What is meant by embedded system? Explain briefly the history of embedded system. **(06 Marks)**
   c. Give four examples of real-time embedded system applications. **(04 Marks)**

2 a. Differentiate between preemptive and non-preemptive scheduling. **(12 Marks)**
   b. Distinguish between RM and DM policies for scheduling. **(08 Marks)**

3 a. Explain intermediate I/O and its applications. **(08 Marks)**
   b. Briefly explain the interconnection networks in RTOS. **(07 Marks)**
   c. Express in brief worst –case execution time with an example. **(05 Marks)**

4 a. Explain briefly pipelining technique, physical memory hierarchy and flash system. **(12 Marks)**
   b. Differentiate between deadlock and live lock. **(08 Marks)**

PART – B

5 a. What is meant by priority inversion? Explain the unbounded priority inversion solutions. **(12 Marks)**
   b. Explain briefly the power management and processor clock modulation. **(08 Marks)**

6 a. What is meant by missed deadlines? Explain how these missed deadlines can be handled. **(08 Marks)**
   b. Explain the RTOS system software mechanisms. **(08 Marks)**
   c. Explain the heap-based message queue communication between tasks in RTOS. **(04 Marks)**

7 a. Explain the single step debugging, kernel scheduler traces and application level debugging. **(12 Marks)**
   b. Explain the basic concepts of drill down tuning and path length, efficiency and calling frequency. **(08 Marks)**

8 Write a short notes on :
   a. ECC
   b. Semaphore
   c. Design trade off
   d. Reliability and reliable software. **(20 Marks)**

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