VIII   EC, EE   (S)

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Time: 3 hrs.   Max. Marks:100

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

PART – A

1 a. Explain with a neat diagram SS7 signaling system and their function.   (10 Marks)
   b. Explain with a neat flow diagram, AMPS mobile originated call.   (10 Marks)

2 a. With a neat block diagram, the MSC sub system.   (08 Marks)
   b. Define and explain the generation of IMSI, IMEI and CGI.   (08 Marks)
   c. What is the purpose of visitor location register and interworking location register? (04 Marks)

3 a. Explain capacity expansion techniques :
      i) Cell splitting
      ii) Cell sectoring
      iii) Overlaid cells.   (10 Marks)
   b. A service provider wants to provide cellular communication to a particular geographic area. The total bandwidth, the service provider is licensed for 5 MHz and system subscriber requires 10 KHz of bandwidth. Determine the system capacity; If the service provider implements a cellular system with 35 transmitter sites and cluster size of 7, determine the new system capacity.   (06 Marks)
   c. Determine frequency reuse distance for cell radius 5 km and cluster size of 7.   (04 Marks)

4 a. Explain briefly service provided by GSM.   (06 Marks)
   b. With a neat block diagram, explain different protocols used in GSM signaling model.   (10 Marks)
   c. Draw and explain GSM TDMA frame with logical channel.   (04 Marks)

PART – B

5 a. Explain GSM intra BSC handover with a neat diagram.   (10 Marks)
   b. Describe GSM chiphering mode setting operation and IMEI check.   (10 Marks)

6 a. Explain with block diagram the generation of CDMA forward traffic control with power control channel for 14.4 kbps traffic.   (10 Marks)
   b. Draw and explain CDMA synchronization channel signal.   (10 Marks)

7 a. Explain convolutional and turbo encoders.   (06 Marks)
   b. Discuss path loss model.   (04 Marks)
   c. Explain with a neat block diagram RAKE receiver.   (10 Marks)

8 a. Discuss the design issues of IEEE 802.11.   (04 Marks)
   b. Explain the working of BDS, DS and ESS network with a neat diagram.   (08 Marks)
   c. Describe the Bluetooth protocol stack with relevant figures.   (08 Marks)

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Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017
Digital Switching Systems

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 network services with diagram showing the relationship of service and bearer networks. **(07 Marks)**
   b. Explain the principle of operation of four-wire circuit with neat diagram. **(08 Marks)**
   c. Explain the principles of time-division multiplexing transmission with elementary TDM system and channel pulse trains. **(05 Marks)**

2 a. What are the different functions of switching system? Explain briefly. **(05 Marks)**
   b. Explain the cross bar system with matrix of cross points. **(05 Marks)**
   c. With diagram, explain the basic central office linkages. (relevant to MDF, TDF, power plant give explanation). **(05 Marks)**
   d. Explain the switching system hierarchy with relevant diagram. **(05 Marks)**

3 a. Explain the congestion in telecommunications traffic system. **(05 Marks)**
   b. During the busy hour, 1200 calls were offered to a group of trunks and six calls were lost. The average call duration was 3 minutes. Find:
      i)   The traffic offered.
      ii) The traffic carried.
      iii) The traffic lost.
      iv) The grade of service.
      v)   The total duration of the periods of congestion. **(05 Marks)**
   c. Explain the lost call system with assumptions, diagram and mathematical expressions. **(10 Marks)**

4 a. Explain the principles of gradings diagrams showing sixteen trunks interconnected to two groups of switches of availability 10. Write the following: i) Full diagram; ii) Grading diagram. **(08 Marks)**
   b. Design a three-stage network for connection 100 incoming trunks to 100 outgoing trunks. Assume suitable data. **(06 Marks)**
   c. Explain briefly about grades of service of link systems. **(06 Marks)**

PART – B

5 a. With relevant diagram explain the principle of operation of the space switch showing the 'K' incoming PCM highways and the in outgoing PCM highways. **(08 Marks)**
   b. Explain the structure of time-space-time (T-S-T) switching network with m is number of PCM highways and 'n' is number of time slots. **(07 Marks)**
   c. With diagram, explain the following exchange synchronization systems:
      i)   Single ended unilateral system.
      ii) Double-ended unilateral system. **(05 Marks)**

6 a. With relevant diagram, explain the digital switching system software classification briefly.
   (08 Marks)
   b. With neat diagram, explain the operation of the software linkages during a call. **(08 Marks)**
   c. Name the different categories of call features. **(04 Marks)**

7 a. With flowchart explain the operation of interfaces of a typical digital switching system central office. **(07 Marks)**
   b. With relevant block diagram approach explain the strategy for improving software quality.
   (08 Marks)
   c. Write a note on 'Defect Analysis'. **(05 Marks)**

8 a. Explain briefly about generic switch hardware architecture with relevant diagram. **(08 Marks)**
   b. Explain about some of the common characteristics of digital switching systems. **(07 Marks)**
   c. Write note on 'Analysis Report'. **(05 Marks)**

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Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017
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. What are the different types of active and passive attacks? **(05 Marks)**
     b. Draw the model for network security and specify the four major tasks performed by it.
          (04 Marks)
     c. For the cipher text "IMWNIAUP" find the plain text using the key "MINIMUM" using playfair cipher. **(05 Marks)**
     d. In an S – DES encryption system the 10 bit key is given as 1001000110. P_{10} is given as $P_{10} = 2\ 7\ 1\ 6\ 3\ 5\ 4\ 9\ 10\ 8$. P_8 is given as $P_8 = 3\ 5\ 6\ 7\ 10\ 2\ 4\ 9$. Deduce sub keys K_1 and K_2. **(06 Marks)**

2   a. Explain with neat block diagrams a single round of DES encryption. **(10 Marks)**
     b. Given the cipher text "E M Q Y". Find the plain text using the key $\begin{pmatrix} 1 & 1 \\ 3 & 2 \end{pmatrix}$ in Hill cipher.
          (07 Marks)
     c. Write three differences between conventional cryptosystems and public key crypto systems. **(03 Marks)**

3   a. Write the RSA algorithm. **(05 Marks)**
     b. In a public key system using RSA intercept the cipher text is 10, sent to a user where public key is 5 and n = 35. Deduce the plain text. **(05 Marks)**
     c. What are message Authentication codes? Give the block diagrams to show how MAC is obtained for i) Authentication ii) Confidentiality and authentication tied to plain text and iii) confidentiality and authentication tied to cipher text. **(10 Marks)**

4   a. Draw a block diagram to show any one use of hash functions. **(02 Marks)**
     b. Explain the arbitrated digital signature approach of the digital signature function. **(10 Marks)**
     c. Explain with diagrams the signing and verifying of digital signature algorithm. **(08 Marks)**

PART – B

5   a. Show the SSL record protocol operation and the details of SSL record format with diagram and explain. **(06 Marks)**
     b. Who are the participants of SET? Give the sequence of events required for SET. Explain with appropriate diagram. **(10 Marks)**
     c. What are the requirements for digital signature? **(04 Marks)**

6   a. Explain why we need web security. **(02 Marks)**
     b. Explain with diagrams how a new password is loaded and how a password is verified.
          (10 Marks)
     c. Explain with diagram the distributed intrusion detection. **(08 Marks)**

7   a. Explain how the compression virus propagates. **(08 Marks)**
     b. Explain the digital immune system. **(10 Marks)**
     c. What are the limitations of fire walls? **(02 Marks)**

8   a. What are the characteristics of a bastion host? **(10 Marks)**
     b. Explain with a diagram the application level gateway. **(10 Marks)**

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Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017
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. Describe the key innovations in telephone networks. **(10 Marks)**
  b. Explain the four networking principles that underlie the growth of communication network services. **(10 Marks)**

2 a. Discuss the implementation of layers in a layered architecture. **(08 Marks)**
  b. Explain with a neat sketch, open data network model. **(08 Marks)**
  c. Give comparison between connection oriented and connection – less service. **(04 Marks)**

3 a. Explain with a neat sketch, TCP header and the steps involved in a TCP connection. **(12 Marks)**
  b. Explain with a neat sketch, the IPV6 header structure. **(08 Marks)**

4 a. Discuss with a neat diagram, V.34 modem. **(05 Marks)**
  b. Explain with a neat sketch, passive photonic loop. **(05 Marks)**
  c. What is INA? Explain the network elements, and its functional components. **(10 Marks)**

PART – B

5 a. With a neat diagram, explain ATM header structures. **(10 Marks)**
  b. Discuss ATM adaption layer, with suitable diagram s. **(10 Marks)**

6 a. Write a short note on Adhoc wireless network and IMT – 2000. **(10 Marks)**
  b. Differentiate between home RF and Bluetooth. **(04 Marks)**
  c. Discuss mobility management in wireless network. **(06 Marks)**

7 a. Discuss the blocking operation in circuit switched network with the help of neat diagram. **(10 Marks)**
  b. Discuss datagram networks queuing model and key queuing result with suitable diagrams. **(10 Marks)**

8 a. How does a WDM system work? How does WDM offer protocol transparency? **(10 Marks)**
  b. Explain ring networks and hierarchical mesh networks with suitable diagrams. **(10 Marks)**

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Eighth Semester B.E. Degree Examination, Dec.2016/Jan.2017
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.   With neat diagrams, explain communication networks used to provide multi-media
         communication services.   **(10 Marks)**
    b.   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 a satellite channel of 50,000 km. Assume that the
         velocity of propagation of a signal in the case of i) and ii) is 2×10^8 ms^{-1} and in the case of
         iii) 3×10^8 ms^{-1}.   **(10 Marks)**

2   a.   List and explain types of text used to produce pages of documents.   **(06 Marks)**
    b.   With schematic diagram discuss audio/sound synthesizer.   **(08 Marks)**
    c.   Derive the time to transmit the following digitized images at both 64 kbps and 1.5 Mbps :
         i) a $640 \times 480 \times 8$ VGA – compatible image, ii) a $1024 \times 768 \times 24$ SVGA – compatible
         image.   **(06 Marks)**

3   a.   Briefly discuss JPEG encoder and decoder.   **(14 Marks)**
    b.   A series of messages is to be transferred between two computers over a PSTN. The
         messages comprise just the characters A through H, Analysis has shown that the relative
         frequency of occurrence of each character is as follows : A and B = 0.25, C and D = 0.14,
         E, F, G and H = 0.055. Derive code word set using Huffman coding.   **(06 Marks)**

4   a.   Discuss ADPCM sub-band encoder and decoder.   **(12 Marks)**
    b.   With neat schematic, discuss MPEG-4 decoder.   **(08 Marks)**

PART – B

5   a.   With neat frame format, explain IEEE802.3 network characteristics.   **(08 Marks)**
    b.   Explain LAN protocol framework.   **(06 Marks)**
    c.   Assuming a signal propagation delay in the fiber of 5 μs per 1 km, derive the latency of the
         following FDDI ring configurations in both time and bits assuming a usable bit rate of
         100 Mbps i) 2 km ring with 20 stations ii) 20 km ring with 200 stations iii) 100 km ring with
         500 stations.   **(06 Marks)**

6   a.   Discuss internet networking components and protocols.   **(10 Marks)**
    b.   Explain IPV6 header fields and format.   **(06 Marks)**
    c.   Determine the amount of padding required in a MAC frame when transmitting an
         ARP/RARP message over i) an Ethernet LAN and ii) an IEEE 802.3 LAN. **(04 Marks)**

7   a.   With neat schematic diagram, explain ATM protocol architecture.   **(12 Marks)**
    b.   Discuss ATM cell formats.   **(08 Marks)**

8   a.   Explain TCP/IP protocol suite and inter layer address selectors.   **(12 Marks)**
    b.   Discuss real-time transport control protocol usage.   **(08 Marks)**

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