VIII   EC, EE   S

USN ☐☐☐☐☐☐☐☐☐☐   **10EC81**

Eighth Semester B.E. Degree Examination, June/July 2016
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. Explain the various steps in AMPS mobile terminated call.   **(10 Marks)**
   b. Explain the characteristics of 2G and 3G cellular systems.   **(10 Marks)**

2 a. Explain the generation of MSISDN, IMSI and IMEI.   **(06 Marks)**
   b. Explain the function of HLR and ILR.   **(06 Marks)**
   c. Explain a mobile originated call in a cellular network with a neat flow diagram. **(08 Marks)**

3 a. A service provider is given license for total bandwidth of 5 MHz and each system subscriber requires 10 kHz bandwidth. Determine the system capacity if the service provider implements a cellular system with 35 transmitter sites and cluster size of 7. **(06 Marks)**
   b. Determine frequency reuse distance for a cluster size of 7 and a cell radius of 6 km. **(04 Marks)**
   c. Explain mobility management concept. Explain the functions of location management with a figure. **(10 Marks)**

4 a. Explain the GSM signaling model.   **(10 Marks)**
   b. Explain the steps in call setup in GSM using mobile station roaming number. **(10 Marks)**

PART – B

5 a. List out the ten operations in call setup in GSM system. Explain in detail ciphering mode setting and IMEI check. **(10 Marks)**
   b. Explain GSM intra BSC handover operation with a figure.   **(10 Marks)**

6 a. Explain the functions of three layers in a network management system. **(10 Marks)**
   b. Explain the generation of CDMA paging channel.   **(10 Marks)**

7 a. Explain the path loss model for free space propagation.   **(05 Marks)**
   b. What is the received power in dBm for a signal in free space with a transmitting power of 1 kW, frequency of 1800 MHz and distance from the receiver of 2000 meters if the transmitting antenna and receiving antennas have a gain of 1.6? What is the path loss in dB? **(05 Marks)**
   c. Explain frequency hopping and direct sequence spread spectrum techniques. **(10 Marks)**

8 a. Discuss the design issues of IEEE802.11 and explain the working of BSS, DS and ESS network. **(10 Marks)**
   b. Explain the details of Bluetooth protocol stack with a figure.   **(10 Marks)**

* * * * *

Eighth Semester B.E. Degree Examination, June/July 2016
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. Draw a neat diagram of four-wire circuit and explain its working.   **(10 Marks)**
    b. A four wire circuit has an overall loss (two-wire to two-wire) of 1 dB and the balance return loss at each end is 6 dB. Find: i) The singing point;   ii) The stability margin; iii) The attenuation of talker and listener echo.   **(06 Marks)**
    c. Write a short note on European pleisochronous digital hierarchy.   **(04 Marks)**

2   a. Differentiate between message switching and circuit switching.   **(04 Marks)**
    b. Explain the functions of electronic switching.   **(06 Marks)**
    c. With the help of neat diagram, explain the basic types of calls that are usually processed through a DSS.   **(10 Marks)**

3   a. Derive the expression for second Erlang's distribution starting from basic principles.
                                                                                    (10 Marks)
    b. Define the following terms:
        i) Busy hour   ii) Grade of service
        iii) Pure chance traffic   iv) Statistical equilibrium   **(04 Marks)**
    c. On an average, one call arrives every 5 seconds. During a period of 10 seconds, what is the probability that:
        i)   No call arrives?   ii) One call arrives?
        iii) Two calls arrive?   iv) More than two calls arrive?   **(06 Marks)**

4   a. What is grading? Explain different types of grading.   **(06 Marks)**
    b. Derive the expression for grade of service of three stage network.   **(08 Marks)**
    c. Design a three stage network for 100 incoming trunks and 400 outgoing trunks.   **(06 Marks)**

PART – B

5   a. Explain S-T-S switching network with neat diagram.   **(06 Marks)**
    b. 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, 0.001, 0.005. Find the traffic capacity of network in mode 1 and mode 2.   **(08 Marks)**
    c. Explain the need for frame alignment in time division switching network.   **(06 Marks)**

6   a. Explain in brief basic software architecture of a typical DSS with neat diagram.   **(10 Marks)**
    b. With a neat diagram, explain digital switching system software classification.   **(10 Marks)**

7   a. Explain the organizational interfaces of typical DSS central office.   **(10 Marks)**
    b. Explain with a neat diagram, a strategy for improving software quality.   **(10 Marks)**

8   Write short notes on:
    a. Generic switch software architecture   b. Recovery strategy
    c. Common characteristics of DSS   d. Analysis report for DSS   **(20 Marks)**

* * * * *

USN | | | | | | | | | | 　　　　　　　　　　　　　　**10EC832**

Eighth Semester B.E. Degree Examination, June/July 2016
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. With a neat diagram, explain network access security model with gate keeper function.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(05 Marks)
　b. Classify and explain different type of attacks. 　　　　　　　　　**(08 Marks)**
　c. Using the keyword "ENCRYPT" create playfair matrix and obtain ciphertext for the message "MATCHFIXED". Also write the rules used. 　　　　**(07 Marks)**

2　a. Explain single round of DES along with the key generation. 　　**(10 Marks)**
　b. Explain the working of counter mode of block cipher operation. 　**(04 Marks)**
　c. Discuss the final evaluation criteria of AES. 　　　　　　　　　**(06 Marks)**

3　a. Justify how both confidentiality and authentication are obtained in publickey cryprosystems.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(05 Marks)
　b. Write RSA algorithm. 　　　　　　　　　　　　　　　　　　　　**(04 Marks)**
　c. In Diffie Hellman key exchange q = 71, its primitive root α = 7 A's private key is 5 B's private key is 12. Find: i) A's public key; ii) B's public key, iii) Shared secret key.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(05 Marks)
　d. Explain the distribution of secret key using the public key cryprography with confidentiality and authentication. 　　　　　　　　　　　　　　　　　　　**(06 Marks)**

4　a. List out the requirements and explain the arbitrated digital signature technique. 　**(10 Marks)**
　b. Compare RSA and DSS approach. 　　　　　　　　　　　　　　**(06 Marks)**
　c. Illustrate replay attack with examples. 　　　　　　　　　　　　**(04 Marks)**

PART – B

5　a. Explain the key requirements and features of SET. 　　　　　　**(10 Marks)**
　b. Discuss SSL record in terms of fragment compression and encryption. 　**(10 Marks)**

6　a. Explain password selection strategies. 　　　　　　　　　　　　**(08 Marks)**
　b. Describe statistical anomaly detection. 　　　　　　　　　　　　**(06 Marks)**
　c. Discuss the different categories of intruders. 　　　　　　　　　**(06 Marks)**

7　a. Give the taxonomy of malicious programs. Briefly explain all the software threats. **(10 Marks)**
　b. Describe digital immune system with diagram. 　　　　　　　　**(06 Marks)**
　c. Brief on four generations of Antivirus software. 　　　　　　　**(04 Marks)**

8　a. What is firewall? Explain the various firewall configurations with relevant diagram.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　(10 Marks)
　b. Write short notes on:
　　i) Data Access Control
　　ii) Concept of Trusted system 　　　　　　　　　　　　　　　**(10 Marks)**

* * * * *

Eighth Semester B.E. Degree Examination, June/July 2016
High Performance Computer Network

Time: 3 hrs.　　　　　　　　　　　　　　　　　　　　　　　　　　　Max. Marks:100

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

PART – A

1. a. Compare digital carrier systems (DCS) hierarchy and synchronous transfer signal (STS) hierarchy with reference to medium, signal and data rates. **(08 Marks)**
   b. What are the two aspects of digitization? Explain the steps involved to digitize a signal. **(06 Marks)**
   c. A telephone network transmits a signal with frequency of 4 kHz and SNR is approximately equal to 48 dB. Find, i) Sampling rate ii) Number of bits per sample. iii) Bit rate of the signal. **(06 Marks)**

2. a. Explain open data network model with a neat diagram. **(08 Marks)**
   b. What is meant by network traffic? Explain different types of network traffic with suitable examples. **(08 Marks)**
   c. An optical link transmits a 10000 – bit packet with a transmission speed of 1 Mbps and its takes about 4 μs to propagate through network. Find total delay experiences through the network. **(04 Marks)**

3. a. Draw the TCP header format and explain each field briefly. **(06 Marks)**
   b. Explain the steps involved in the connection establishment and connection termination procedure in TCP. **(04 Marks)**
   c. Explain window adjustment in TCP. Derive an expression for throughput (R) in terms of loss rate (L). **(10 Marks)**

4. a. Draw the different layers of SONET overhead and explain. **(08 Marks)**
   b. Draw the frame structure of telephony on passive optical network (TPON) for the downstream signal. **(04 Marks)**
   c. Draw ISDN architecture and explain. **(08 Marks)**

PART – B

5. a. Explain ATM header structure. **(08 Marks)**
   b. Explain ATM adaptation layer with a neat diagram. **(06 Marks)**
   c. If the link speed of STS-3 signal is 155 Mbps, given a cell size of 53 bytes, 80 percentage loading and one cell per unit time as service rate, calculate: i) Unit of time (per bit) ii) Average number of cells in the buffer. Iii) Queuing delay. **(06 Marks)**

6. a. What is multiple access? List the various multiple access techniques. **(07 Marks)**
   b. What is spectral etiquette? List the etiquette rules. **(06 Marks)**
   c. Explain different architecture of wireless network. **(07 Marks)**

7. a. What are the basic control methods? Explain with time scales and types of information. **(10 Marks)**
   b. Write short notes on:
      i) Internet Service Providers.
      ii) Empirical evidence. **(10 Marks)**

8. a. Explain the architecture of an optical cross connects. **(08 Marks)**
   b. Explain optical ring networks and hierarchical mesh networks. **(06 Marks)**
   c. Describe single-hop LANs with relevant diagrams. **(06 Marks)**

* * * * *

Eighth Semester B.E. Degree Examination, June/July 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.   Explain any two multimedia networks that provides single type of service?   **(08 Marks)**
    b.   Which are the modes of multipoint conferencing. And explain with diagram.   **(06 Marks)**
    c.   Define Network Quality of Service parameters. Explain packet switched network parameters.   **(06 Marks)**

2   a.   Derive the bit rate and memory requirements to store each frame that result from the digitization of both a 525 line system and a 625 line system assuming a 4:2:0 format. Also find the memory required to store a 1.5 hour movie/video.   **(08 Marks)**
    b.   Explain any two types of texts in detail.   **(06 Marks)**
    c.   Differentiate Non-interlaced and interlaced scanning.   **(06 Marks)**

3   a.   What are pass mode, vertical mode and horizontal modes in run length possibilities and explain the same with flow chart.   **(07 Marks)**
    b.   Describe forward DCT, quantization block of JPEG standard.   **(06 Marks)**
    c.   Construct Huffman table and code tree for the given characters. Relative frequency of occurrence of each character is as follows :
A and B = 0.25, and C and D = 0.14, E, F, G and H = 0.055. Also derive the set of code-words for the given characters   **(07 Marks)**

4   a.   Explain perceptual features of the ear and vocal tract excitation parameters. With a neat diagram, explain linear predictive coding (LPC) signal encode and decoder.   **(10 Marks)**
    b.   Explain H.261 video compression standard with the help of macro block format frame format and GOB structure.   **(10 Marks)**

PART – B

5   a.   Explain in detail with diagrams LAN protocols and protocol frame work.   **(10 Marks)**
    b.   What is a transparent bridge? With a neat diagram. Explain transparent architecture and its application example.   **(10 Marks)**

6   a.   Explain the operation of internet with a neat diagram of protocol components. Assuming the IP address formats, derive the range of host addresses for classes A, B and C. express the answer in dotted decimal notation and also straight decimal.   **(10 Marks)**
    b.   Explain in detail datagram format of IPV6.   **(10 Marks)**

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

8   a.   Explain RTP and RTCP protocols.   **(10 Marks)**
    b.   Explain TCP/IP protocol suite with a diagram.   **(10 Marks)**

* * * * *