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## Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018
## 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. Compare 1G and 2G cellular system. (04 Marks)
   b. Explain the different steps involved in AMPS-Mobile originated call. (08 Marks)
   c. With a neat diagram, explain the network elements of the SS7 system. (08 Marks)

2  a. With a block diagram, explain the MSC subsystem. (06 Marks)
   b. Explain the functions of HLR, VLR and MSC. (06 Marks)
   c. Explain with necessary diagrams the formats of MSISDN number, IMSI number, IMEI number and LAI number. (08 Marks)

3  a. Explain capacity expansion techniques,
      (i) Cell splitting      (ii) Cell sectoring (06 Marks)
   b. Explain the different power saving schemes. (06 Marks)
   c. For a particular radio transmission technology, a minimum S/I ratio of 15 dB is needed for proper operation. What is the minimum required cluster size? If the path loss exponent is $\alpha = 4$? Assume that there are six-co-channel cells in the first tier and all of them are at the same distance from the mobile. (05 Marks)
   c. Determine the frequency reuse distance for a cell radius of two kilometers and a cluster size of 4. (03 Marks)

4  a. Explain the various logical channels used in GSM. (10 Marks)
   b. Describe GSM protocols and signalling model with a neat diagram. (10 Marks)

### PART – B

5  a. List out the ten operations in call setup in GSM system. Explain in detail authentication and ciphering mode operation. (12 Marks)
   b. Explain the intra-BSC-handover operation in GSM. (08 Marks)

6  a. Explain the basic spread spreading operation in CDMA. (06 Marks)
   b. Explain the different types of soft and hard handoffs supported by CDMA system. (06 Marks)
   c. Explain the generation of CDMA paging channels. (08 Marks)

7  a. Explain the path loss model for free space propagation. (06 Marks)
   b. With a neat block diagram, explain the RAKE receiver. (06 Marks)
   c. What is the received power in dBm for a signal in free space with a transmitting power of 50 W, frequency of 900 MHz and distance from the receiver of 100 meters if the transmitting antenna and receiving antennas have a gain of 1? What is $P_r$ at 10 km? (08 Marks)

8  a. Explain with a neat figure the Bluetooth protocol stack. (08 Marks)
   b. Discuss the design issues of IEEE 802.11 and also provide the working of BSS, DS and ESS networks. (08 Marks)
   c. Describe the basic wireless MAN. (04 Marks)

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## Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018
## 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. Describe the four principles that underlie the growth of communication network services. **(08 Marks)**
   b. Compare the Capabilities of the internet, ATM, Cable TV and Wireless Networks to provide the core technologies that can be used to develop the information super highway. **(08 Marks)**
   c. Sketch the heterogeneous future network. **(04 Marks)**

2  a. Explain the traffic characteristics with reference to its quality of service. **(08 Marks)**
   b. Illustrate the performance analysis of the communication networks using the queuing network model. **(08 Marks)**
   c. List the current major technology bottlenecks in achieving a high performance networks. **(04 Marks)**

3  a. Explain briefly the improvements that can be incorporated in TCP. **(08 Marks)**
   b. Explain the Internet implementation of the open data network model. **(08 Marks)**
   c. Write a short note on mobile IP. **(04 Marks)**

4  a. With a neat figure, explain the SONET frame along with its functions. **(06 Marks)**
   b. Describe the physical layer in ADSL, enumerate on the additional requirement for the network layer. **(09 Marks)**
   c. Briefly explain the functional components involved in Intelligent network architecture. **(05 Marks)**

### PART – B

5  a. Define : (i) Peak cell rate    (ii) Initial cell rate    (iii) Burst tolerance. **(06 Marks)**
   b. Explain the structure of ATM header with a neat figure. **(10 Marks)**
   c. Compare multicast IP over ATM. **(04 Marks)**

6  a. Describe the Link layer design techniques developed to overcome wireless channel impairments to deliver high data rate with low distortion. **(10 Marks)**
   b. Briefly give an overview of emerging system and standards for future wireless networks. **(10 Marks)**

7  a. Describe the objectives and methods of control of networks. **(10 Marks)**
   b. Illustrate an analysis of subscriber demand model for internet service. **(10 Marks)**

8  a. Describe the functional architecture of reconfigurable optical cross connect. **(10 Marks)**
   b. Write a brief note on:
     (i) WDM systems    (ii) Multi hop lan. **(10 Marks)**

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# Eighth Semester B.E. Degree Examination, Dec.2017/Jan.2018
## Multimedia Communication

Time: 3 hrs. Max. Marks:100

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

## PART – A

1  a. With the aid of a diagram, explain how voice mail and teleconferencing are supported with reference to speech only interpersonal communication involving both PSTN – ISDN/ PBX networks. **(08 Marks)**
   b. Explain multipoint conferencing modes of operation. **(08 Marks)**
   c. 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 200km
      iii) A connection over a satellite channel of 50,000 km. Assume the velocity of propagation of a signal in case of : i) $2 \times 10^8$ m/s ii) $3 \times 10^8$ m/s. **(04 Marks)**

2  a. Explain the principle of operation of PCM speech CODEC with a block diagram. Also explain the compressor and expander characteristics. **(10 Marks)**
   b. Explain with schematic and relevant diagram color image capture using digital camera and scanner. **(07 Marks)**
   c. Assuming the bandwidth of a speech signal is from 50Hz through 10 KHz and that of music signal is from 15Hz through to 20KHz, derive the bit rate that is generated by the digitization procedure in each core assuming Nyquist sampling rate is used with 12 bits per sample for speech signal and 16bits per sample for music signal. Derive the memory required to store 10 min passage of stereophonic music. **(03 Marks)**

3  a. Apply arithmetic coding for encoding the string $CA \in \in S$ given $P_A = 0.2$, $P_B = 0.1$, $P_C = 0.2$, $P_D = 0.05$, $P_E = 0.3$, $P_F = 0.05$, $P_S = 0.1$. Draw the range diagram. **(08 Marks)**
   b. Explain in detail JPEG encoder and bit stream format with neat diagrams. **(12 Marks)**

4  a. Explain with a neat schematic, the LPC signal encoder and decoder. **(08 Marks)**
   b. Explain BFrame encoding procedure. **(06 Marks)**
   c. Explain error tracking scheme with H·263. **(06 Marks)**

## PART – B

5  a. With a neat diagram, explain transparent bridge. **(07 Marks)**
   b. Derive the maximum obtainable throughput and the maximum access delay for the following three ring configuration.
      i)   2km ring with 20 stations
      ii)  20km ring with 200 stations
      iii) 100km ring with 500 stations.
      Assume for i) $T_1 = 30$ µs or 3000 bits ii) $T_1 = 300$ µs or 30,000 bit and iii) $T_1 = 1000$ µs or 100000 bits. **(07 Marks)**
   c. Explain with diagram : i) MAC user service primitive for CSMA/CD and token ring ii) LLC/MCA sublayer interaction. **(06 Marks)**

6  a.  With the neat diagram explain IP adjunet protocols. **(05 Marks)**
   b.  Explain with diagram IPV4 datagram/Packet format and header fields. **(07 Marks)**
   c.  Assume a message block of 7000 bytes is to be transferred from one host to another host, assume token ring LAN at source end with MTU of 3000 bytes and Ethernet LAN at other end with MTU of 1500 bytes. If identification is 20 B, with a neat diagram illustrate fragmentation and re-assembly. **(08 Marks)**

7  a.  Explain protocol architecture to support classical IP over an ATM LAN. **(08 Marks)**
   b.  Explain with relevant diagram ATM cell format, cell switching principles and routing of ATM cell. **(12 Marks)**

8  a.  Explain with example and diagram all methods for small segment transfer with TCP. **(10 Marks)**
   b.  Explain RTP and RTCP with relevant diagrams. **(10 Marks)**

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