SE-VIII (CBSGS) / EXTC / Wireless Network / May-2018.

Q. P. Code: 36601

(3 hours) (Marks:80)

N.B. (1) Question 1 is compulsory.

(2) Solve any three from remaining five.

(3) Draw neat sketches wherever require.

(4) Assume suitable data if required.

1.		Solve any four	
	(a)	Explain E-UTRAN with suitable diagram	5
	(b)	What are the three phases of wireless network design? Explain	5
	(c)	What is 'hidden node' and 'exposed node' problem in WLAN?	5
	(d)	What are the basic middleware functions for WSN? Explain.	5
	(e)	With a suitable example explain category 1 and category 2 of sensor network	5
2.	(a)	Explain middleware architecture of WSN	10
	(b)	Explain HSDPA emphasizing its primary objectives and how it achieves performance improvement?	10
3.	(a)	Give the detailed radio access network overview. Explain in detail functions of Node B and RNC also draw UTRAN logical architecture	10
	(b)	List out the factors affecting size of the cellular network and the frequency planning. Discuss these factors in detail.	10
4.	(a)	Why TCP and UDP protocols are unsuitable for implementation in WSN.	10
	(b)	Using the following data for a GSM network, estimate the voice and data traffic per subscriber. If there are 40 BTS sites, calculate voice and data traffic per cell.	10

- Subscriber usage per month: 150 minutes
- Days per month: 24
- Busy hours per day: 6
- Allocated spectrum: 4.8MHz
- Frequency reuse plan: 4/12
- RF channel width: 200 kHz(full rate)
- Present no. of subscriber in the zone: 50,000
- Subscriber growth per year: 5%
- Network roll out period: 4 years
- Number of packet calls per session (NPCS): 5
- Number of packets within a packet call (NPP): 25
- Reading time between packet calls (T_r): 120s
- Packet size (NBP): 480 bytes
- Time interval between two packets inside a packet call (T_{int}): 0.01s
- Total packet service holding time during one hour (T_{tot}): 3000s
- Busy hour packet sessions per subscriber: 0.15
- Penetration of data subscribers: 25%
- Data rate of each subscriber: 48 kbps
- Packet transmission time: 10 s

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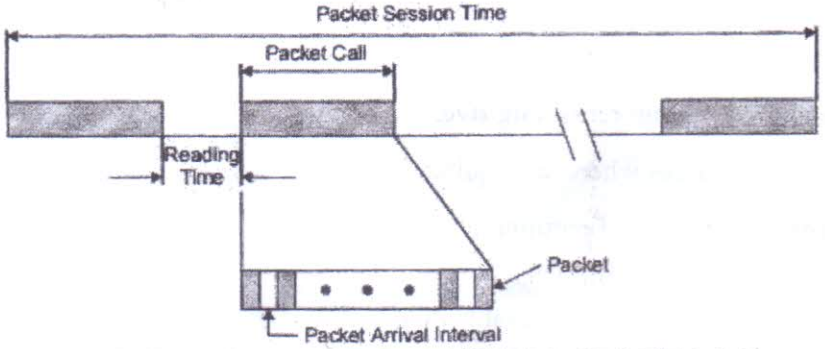

5. (a) Why network management design is critical issue in WSN? Explain. 10
   (b) What is localization of WSN nodes? Explain with examples centralized and distributed schemes in localization. 10
6. (a) Explain Bluetooth security features and security levels with proper diagram 10
   (b) Write short note on (any two): 10
   (1) WIMAX
   (2) RFID
   (3) ZigBee
   (4) LTE

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BE/EXTC/CBSGS/SEM VIII/SCN/17-18

: 36601

Q. P. Code: 27441

Time: 3 hours **Marks: 80**

NB: 1) Question number 1 is compulsory.
2) Answer any three questions out of remaining questions.
3) Answer the questions with suitable diagrams.

1. Answer the following 10
   (a) Discuss 1) GPS and VSAT
   (b) Compare (i) FH- CDMA and DS-CDMA. 10
   (ii) Explain Launching of Geo stationary satellites

2. (a) Explain block diagram of Transmit and receive type of earth station, 10
   Explain each block in detail.
   (c) Which types of antennas are used in satellite communication 10
   Explain one antenna in detail

3. (a) What is Earth eclipse of Satellite ? 10
   Are there any ways of avoiding eclipse during lifetime of satellite.
   (b) Explain the following: 10
   (i) 1 db Compression point
   (ii) AM to PM conversion

4. (a) Describe different stabilization Techniques 10
   (b) Explain TT & C system with the help of block diagram. 10

5. (a) What is EIRP ?discuss the importance of[G/T] ratio
   Calculate overall [C/N] for a satellite link if
   [C/N] uplink=25db, [C/N] downlink=20db and [Intermodulation] =12db
   (b) Explain SPADE system and SCPC of FDMA 10

6. Write short notes on ***any* two** 20

   (a) Optical link satellite transmitter and receiver
   (b) Onboard connectivity with transparent processing
   (c) Frame organization and window organization

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m-VIII (CBSGS) / EXTC / Internet & voice communication / M-18

Q.P. Code: 40105

Duration: 3 hours **Max marks: 80**

Note the following instructions.

(a) Question No.1 is compulsory
(b) Total 4 questions need to be solved
(c) Attempt any three questions from remaining five questions.
(d) Assume suitable data wherever necessary, justify the same

1. **[5x4]**

a. Explain Control bits (flags) in TCP header.
b. Draw the OSI Model and list two functions of each layer.
c. An IP datagram has arrived with the following information in the header.
45 00 00 54 00 03 00 00 20 06 00 00 7C 4E 03 02 B4 0E 0F 02
i) What is the version of IP? ii) Are there any options? iii) Is the packet fragmented? iv) What is the header length? v) What is the size of the data? vi) Is a checksum used? vii) How many routers can the packet travel to? viii) What is the identification number of the packet? ix) What is the type of service? x) The data belong to what upper layer protocol?
d. Explain the standard designed by ITU to allow telephones on public telephone network to talk to computers connected to the internet.

2. **[10x2]**

a. Explain in brief one message transfer agent and one message access agent.
b. Discuss DHCP operation when the client and server are on the same network or on different network.

3. **[10x2]**

a. List and explain purpose of each timer in TCP.
b. Discuss how TCP implements flow control in which the receive window controls the size of the send window.

4. **[10x2]**

a. Explain the digitization and compression of Audio and Video.
b. An ISP is granted a block of addresses starting with 120.60.4.0/20. The ISP wants to distribute this block to 100 organizations with each organization receiving 8 addresses only. Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.

5. **[10x2]**

a. Explain the protocol designed to handle real-time traffic on the internet.
b. Explain an application layer protocol that establishes, manages,and terminates a multimedia session(call).

6. Write a short note on : **[5x4]**

a. Private IP address.
b. Domain name system.
c. Connection establishment in TCP using Three-way Handshaking.
d. Techniques to Improve Quality of Service (QoS).

Sem-VIII (CBSGS) / EXTC / Speech Processing / M-18

Q. P. Code: 38795

Duration: 3 Hours **Marks: 80**

N.B: (1) Question No. 1 is compulsory
(2) Attempt any Three questions from the remaining Five questions
(3) Figures to the right indicate full marks

1. (a) Explain the procedure to calculate the short time energy of speech signal? [4]
(b) What is prosody with regards to speech synthesis? [4]
(c) Explain formation of vowels either by showing a vowel quadrilateral or a vowel triangle. [5]
(d) Is the speech signal stationary or non-stationary? Justify your answer. [4]
(e) Explain the use of wideband spectrogram of a speech signal. [3]

2. (a) What are the various forms of STFT? Give expressions for each case. Explain interpretation of short-time spectrum analysis as filters with suitable block diagram. [8]
(b) Elaborate with suitable equations any three methods for estimating the pitch of a speech signal. [6]
(c) Write a note on production of semivowels and nasals. How can we differentiate them on the basis of their formant values? [6]

3. (a) Explain how Linear Prediction Filter for speech prediction represents an all pole filter? What should be the order of the filter to be considered for practical applications? [10]
(b) Draw the lattice structure of an all pole filter of order one showing proper equations. [10]

4. (a) Explain with a suitable block diagram and proper waveforms a procedure to separate the vocal tract frequency response from the excitation in a speech signal. [10]
(b) Explain the necessity of the mel scale with reference to the hearing mechanism. [10]

5. (a) Explain with suitable equations the Levinson Durbin algorithm for calculation of the predictor coefficients. [8]
(b) Explain the applications of speech processing in detail. [5]
(c) Explain with a suitable example the dynamic time warping algorithm. [7]

6. (a) What is CELP? Explain the US federal standard 1016 using CELP? [10]
(b) Draw the state diagram for HMM as a general case and explain how you would develop a transition matrix from the same. [10]

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Sem-VIII (CBSGS)/EXTC/Telecom Network Management/
M-18

Q.P. Code : 17003

[Time: Three Hours] **[Marks:80]**

Please check whether you have got the right question paper.

N.B:
1. Q.1 is compulsory
2. Solve any three questions out of remaining.
3. Assume suitable data if necessary stating it clearly

1	a) What is OMAP in network management?	05
	b) What is remote monitoring?	05
	c) Compare between SNMPv1 and SNMPv3?	05
	d) Describe Code Book Reasoning based event correlation technique?	05
2	a) You are administering the 24000 workstations in an organization. You are pinging each station periodically. The message size in both directions is 128 bytes long. The NMS you are using is on a 10-Mbps LAN, which functions with 30% efficiency. What would be the frequency of your ping if you were not to exceed 5% overhead?	10
	b) List and describe SNMP various commands with command syntax.	10
3	a) With respect to ISO/OSI network management: Describe following terms: i) Scoping and Filtering ii) Linked Replies iii) GDMO iv) ACSE and ROSE	10
	b) Draw a neat diagram of TMN functional architecture with interfaces.	10
4	a) List and describe RMON2 MIB groups with their functions.	10
	b) What is SNMP proxy server?	10
5	a) Explain user security model (USM) of SNMPv3?	10
	b) Draw and describe SNMP v1 message and SNMP v1PDU formats.	10
6	a) Explain the significance of Trap. Describe the different types of traps.	10
	b) What is ATM Network management?	10

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