(3 Hours) [Total 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.

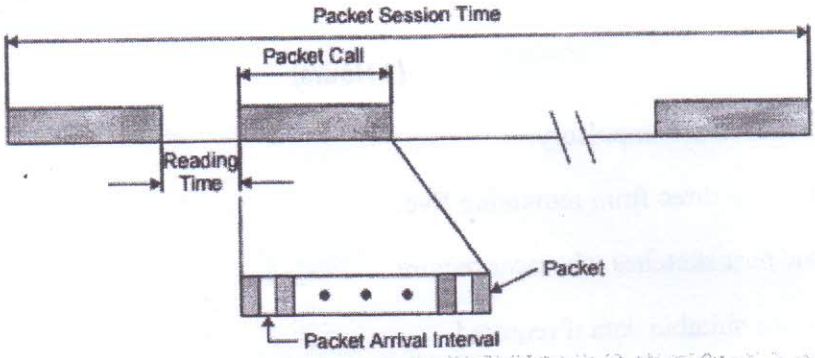
1. **Solve any four**

	(a)	Give the features of LTE	5
	(b)	Explain various states in Bluetooth system	5
	(c)	What are the three phases of wireless network design? Explain	5
	(d)	What are the basic middleware functions for WSN? Explain.	5
	(e)	What is RFID? Discuss different components of RFID and explain how the communication takes place among the components?	5

2. (a) 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



(b) Explain link budget analysis requirement of wireless network. 10

3. (a) Give detailed radio access network overview. Explain in detail functions of Node B and RNC also draw UTRAN logical architecture. 10

(b) Explain HSDPA emphasizing its primary objectives and how it achieves performance improvement? 10

4. (a) Explain the ZigBee technology. Discuss different network topologies that are supported in ZigBee. 10

(b) Explain Bluetooth security features and security levels with proper diagram. 10

5. (a) Why TCP and UDP protocols are unsuitable for implementation in WSN? List out transport protocols designed for WSN. Explain any one in detail. 10

(b) Describe the model of Wireless Sensor Network. What are the factors influencing design of wireless sensor network 10

6. Write short note on **(any two)** 20

(a) IEEE 802.16

(b) Middleware architecture of WSN

(c) UWB technology

EXTC/SEM VIII/ Paper / Subject Code: 52906 / Satellite Communication & Networks / MAY 2019
CBSGS

Duration: 3 Hours **Marks: 80**

Note:

1) Q.1 is **compulsory**.
2) Attempt any **three** questions from the remaining **five** questions.
3) Assume Suitable data wherever necessary

Q1. Attempt any four **20**

a) Why LAN is placed close to outdoor unit? 10

b) What are the space particles? What is the impact on satellite? The TWT has limited life and less reliable to other subsystems justify 10

c) Explain different orbital parameters 10

d) Explain design considerations of Earth station 10

e) Differentiate window and frame organization

Q2. a) What is EIRP, Discuss importance of [G/T] ratio. Calculate Overall [C/N] for a satellite link, if [C/N] up link =25dB and [C/N] downlink=20dB and intermodulation noise =13dB **10**

b) Explain

1) Input Back off and output back off 10

2) AM/PM Conversion 10

Q3 a) Define 'Satellite perturbation', their causes and effects **10**

b) What are different types of lasers used for satellite communication? Explain acquisition link model for optical communication **10**

Q4 a) What is meant by sub-system reliability & its Characteristics? Hence explain the terms:- initial failure, random failure & wear-out failure **10**

b) With the help of block diagram explain transmit receive type of earth station **10**

Q5 a) Explain SPADE system and SCPC of FDMA **10**

b) Explain earth Eclipse of satellite with neat sketches. State & Derive the period & duration of eclipse before & after equinox. Also explain the Sun Transit **10**

Q6. Write short note on any TWO **20**

a) Onboard connectivity with transparent processing

b) VSAT and GPS

c) TTC

59556

Sem- VIII
c/ CBSGS.

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

Note the following instructions.

1) **Question No.1** is **compulsory.**
2) Total **four** questions need to be solved.
3) Attempt **any three** questions from remaining five questions.
4) Assume suitable data wherever necessary, justify the same.

1.a	With an example define the physical address, the internetwork address (IP address), the port address and application specific address.	**5**
1.b	Explain how H.323 uses G.71/ G.723.1, H.225, Q.931 and H.245 to establish and maintain voice (or video) communication.	**5**
1.c	Differentiate between subnetting and supernetting.	**5**
1.d	The following is a dump of a UDP header in hexadecimal format. CB840035001C001C i) What is the source port number? ii) What is the destination port number? iii) What is the total length of the user datagram? iv) What is the length of the data? v) Is the packet directed from a client to a server or vice versa?	**5**
2.a	Explain the process of sending Email using message transfer agent.	**10**
2.b	Discuss the DHCP operation when the client and server are on the same network or on different networks.	**10**
3.a	Explain how TCP controls the congestion in the network using different strategies.	**10**
3.b	An ISP is granted a block of addresses starting with 150.80.0.0/16. The ISP wants to distribute these blocks to 2600 customers as follows: i) The first group has 200 medium-size businesses; each needs approximately 128 addresses. ii) The second group has 400 small businesses; each needs approximately 16 addresses. iii) The third group has 2000 households; each needs 4 addresses. Design the subblocks and give the slash notation for each subblock. Find out how many addresses are still available after these allocations.	**10**
4.a	Draw the general format of ICMP messages. Discuss the purpose of error-reporting and query messages.	**10**
4.b	Explain quality of service (QoS) and how it can be improved using scheduling techniques and traffic shaping techniques.	**10**
5.a	Discuss some characteristics of real-time audio/video communication.	**10**
5.b	Draw the IP header format and explain all fields in brief.	**10**
6	Write short note on: a) FTP b) Control field or flags of TCP c) Messages used in RTCP d) TCP Timers	**20**

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Time: 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 with suitable examples the production of fricatives and stops. [4]
   (b) How is the code book generated for CELP? [4]
   (c) Explain concatenative synthesis. What is the advantage of using sub-word units? [4]
   (d) How can we differentiate between semivowels and nasals on the basis of their formant values? [4]
   (e) Explain the meaning of intonation. What are the different intonations used in general speaking? [4]

2. (a) How is STFT different from Fourier Transform? Explain the difference with respect to the speech signal. [7]
   (b) Compare and contrast the pitch detection methods by using Cepstral coefficients and LPC parameters. [7]
   (c) Explain in detail how the radiation at the lips affect the resonance frequency of the vocal cords. [6]

3. (a) Explain with proper equations how Linear Prediction Filter for speech prediction represents an all pole filter? [10]
   (b) Perform the LPC analysis to determine the predictor coefficients given the autocorrelation sequence as $r_{xx}(0) = 2.1$, $r_{xx}(1) = 1.5$, $r_{xx}(2) = 0.9$. [10]

4. (a) Design a Homomorphic processing system for filtering of a speech signal. [10]
   (b) Draw and explain the schematic representation of the ear. Emphasize on the human hearing mechanism. [10]

5. (a) What is the significance of the Levinson Durbin algorithm. State the necessary equations involved during the execution of the algorithm for calculation of the predictor coefficients. [8]
   (b) Explain the applications of speech processing in detail. [5]
   (c) What are the different speech standards? Explain any one of them in detail [7]

6. (a) Explain Bayes rule for class selection. [6]
   (b) Draw the block schematic for a formant synthesizer. Explain the function of each block. [10]
   (c) In linguistics what is the meaning of prosody? [4]

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(3 Hours) **Max Marks: 80**

Note:
1. **Question No. 1 is compulsory.**
2. **Out of remaining questions, attempt any three questions.**
3. **Assume suitable additional data if required.**
4. **Figures in brackets on the right hand side indicate full marks.**

1. (A) Explain the TMN Conceptual model. (05)
   (B) Write a short note on: Semi Formal and Formal notations. (05)
   (C) What encoding mechanisms are used by ASN.1 ? (05)
   (D) What is LAN emulation? (05)

2. (A) State the additional capabilities of RMON2 over RMON1 and explain how these capabilities can be used for an enterprise network management. (10)
   (B) Describe two tier and three tier network management organization model. (10)

3. (A) What is the difference between accounting management and performance management? (10)
   (B) List and describe SNMP commands with Syntax. (10)

4. (A) What are the functional requirements of NMS design? (10)
   (B) What is ATM remote monitoring? (10)

5. (A) Describe the services offered by CMISE. (10)
   (B) What is policy based security management in SNMP v3. (10)

6. (A) Describe three scenario that require event correlation techniques and explain clearly why each one need it. (10)
   (B) Describe different Network management models and standards. (10)
