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

Note the following instructions.

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

Q.1 (a) How iterative resolution differs from recursive resolution in DNS ? **[5]**
(b) What is the role of registration server in tracking a callee ? **[5]**
(c) Differentiate between Subnetting and Supernetting. **[5]**
(d) Explain the connection establishment Process in TCP with suitable diagram. **[5]**

Q.2 (a) What are the special addresses used in classful addressing? Explain any three with suitable example. **[10]**
(b) Explain the various phases of congestion control in TCP with suitable diagram. How the window size is set in each phase? **[10]**

Q.3 (a) Draw the DHCP packet format. With reference to this which field determines- **[10]**
i) The no. of hops a packet can travel.
ii) The command is a request or reply.
iii) Why there is a need of transaction Id apart from IP address and port address ?
iv) What is the maximum number of seconds that can be stored in the Number of Seconds field of a DHCP packet ?
v) Which field determines that the response from the server is unicast or broadcast ?
vi) If DHCP packet is request from client, which fields are used ?
vii) If DHCP packet is a reply message from server, which fields are used ?

(b) Name the various components of Email system. List the function of them. Which protocol defines the MTA client and server in internet ? **[10]**

Q.4 (a) What are various schemes to improve QoS ? Explain any one in brief. **[10]**
(b) Which protocol is used to communicate between public telephone network and computer on internet ? Explain its operation with suitable illustrations. **[10]**

Q.5 (a) One of the addresses in a block is 17.63.110.114/24. Find the network address, network mask, number of addresses, the first address, and the last address in the block. **[10]**
(b) Why do we need fragmentation at each router? Explain the various fields associated with fragmentation in IP header. A host is sending 100 datagrams to another host. If the identification no. of the first datagram is 1024. What is the identification no. of the last ? **[10]**

Q.6 (a) Why there is need of ICMP Protocol at network layer ? List various messages used in ICMP protocol. Explain the function of any two messages in brief. **[10]**
(b) Compare the TCP header and UDP header. List the fields in the TCP header that are not the part of UDP header. **[10]**

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(3 Hours) **[Total Marks - 80]**

N.B i) Question no.**1** is compulsory

ii) Solve any **three** from the remaining **five** questions

1	a.Explain the 'Zone planning' concept for the Indoor radio planning.	5
	b. What is the pole capacity of the cell ?	5
	c. Discuss the Advanced Antenna systems used in HSPA and LTE.	5
	d. With a suitable example explain category 1 and category 2 of sensor network	5
2	a.] 'CDMA is interference limited system'.Justify and explain the need for power control.	10
	b. Give the detailed radio access network overview. Explain in detail functions of Node B and RNC also draw UTRAN logical architecture.	10
3	a. Explain Bluetooth security features and security levels with proper diagram	10
	b. Elaborate on Zigbee components , topologies and protocol stack.	10
4	a. Explain the relevance of CSMA/CA technique in WLAN and the concept of Hidden Node and Exposed Node.	10
	b. There are various resource constraints in the design and implementation of WSN . Justify.	10
5	a. How does a typical RFID system work ? Discuss its components and list its applications.	10
	b. Why TCP and UDP protocols are unsuitable for implementation in WSN.	10
6	Write notes on **[any two]**	20
	a. Middleware architecture of WSN	
	b. UWB technology	
	c. Routing challenges in WSN	

(3 Hours) **[Total Marks: 100]**

N.B.: (1) **Question No.1** is **compulsory**.
(2) Attempt **any three** questions from the remaining questions.
(3) Assumptions made should be clearly stated.
(4) Assume any suitable **data** wherever **required** but **justify the same**.
(5) **Figures** to the right indicate **full marks**.
(6) **Illustrate answer** with **sketches** wherever **required**.

1 a) Explain two-tier network management organization model. **[05]**

b) Compare between CMIS/CMIP and SNMP. **[05]**

c) Explain TNM conceptual model. **[05]**

d) Explain the challenges faced by the network managers while managing a network. **[05]**

2 a) Explain the purpose of TRAP and Discuss the SNMP TRAPS. **[10]**

b) Describe SNMP various command with syntax. **[10]**

3 a) Explain ATM Network Management. **[10]**

b) Explain User security model (USM) of SNMP v3. **[10]**

4 a) Explain various M interfaces used between ATM end user or Device and ATM network. **[10]**

b) Explain ATM remote monitoring. **[10]**

5 a) Describe network management information Model. **[10]**

b) Describe Network Management Communication and Function Model. **[10]**

6 a) Explain the need for TMN and Hence OSI network Management Architecture. **[10]**

b) Explain the service offered by CMISE. **[10]**

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

Note the following instructions.

1. **Question No.1** is **compulsory**.
2. Attempt **any three** questions from remaining **five** questions.
3. **Figures** to the **right** indicate **full marks**.

1. Answer **any four** questions :

(a) Explain speech recognition system with a block diagram **[5]**

(b) Using vowel triangle, how do we categorize different vowels **[5]**

(c) Explain the human speech production system with the help of a schematic representation of its physiological mechanism. **[5]**

(d) Explain pitch period estimation using parallel processing approach **[5]**

(e) What is pre-emphasis and how can it help in speech analysis **[5]**

2. (a) Explain the two interpretations of STFT. Give expressions for each case. Also derive the Sampling rate of STFT **[10]**

(b) Draw and explain a general discrete time model of speech production system. **[10]**

3. (a) Derive the overall transfer function (frequency response of uniform tube in terms of volume velocities at glottis and lips) for a uniform lossless tube model of the vocal tract **[10]**

(b) With the help of block diagram, explain the working of clipping auto correlator. What are the advantages of using three level clipper? **[10]**

4. (a) Explain in detail the procedure for computation of pitch and formants based on cepstral analysis of speech. **[10]**

(b) Explain template matching approach using Dynamic time warping technique (DTW) **[10]**

5. (a) With related equations explain the terms Short time energy, short time magnitude and short time zero crossing rate. How do you distinguish voiced and unvoiced segments based on these parameters? **[10]**

(b) Explain in detail RELP with a block diagram **[10]**

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

(a) Mel frequency cepstral coefficients (MFCC)

(b) Code excited LP (CELP) based vocoders

(c) Speech recognition systems

Duration: 3 Hrs. **Marks: 80**

NB:

Q.l is compulsory.
Solve any three from remaining five questions.
Assume suitable data wherever required.
Draw required diagrams neatly.

Q.l Solve any Five: **20**

a) Discuss the signification of Microwave frequency in Satellite communication.
b) Explain different tests conducted for the selection of Satellite component.
c) Explain why 14/12 GHz band is used for DTH application, what are the advantages and disadvantages of this band?
d) Define and explain reliability in satellite.
e) Explain AM/PM conversion.
f) How does back off power affect satellite link performance?

Q.2 **20**

a) Give a detail comparison between low, medium and high attitude satellite.
b) Discuss the effect of earth's oblateness, moon and sun on the orbit of satellite. Explain "Parking orbit".

Q.3 **20**

a) A carrier 6/4 GHz satellite uplink has the following data: Earth station EIRP = 80dBW; Earth station satellite distance = 35780 km; attenuation due to atmospheric factor = 2dB; satellite antenna efficiency = 0.8; satellite antenna's aperture area 0.5m^2; satellite receiver's effective noise temperature = 190K; satellite receiver band width = 20 MHz. Determine the link margin if the threshold value of received carrier to noise ratio is 25dB.
b) Describe the significance of carrier to noise ratio, carrier to noise density ratio and bit energy to noise density ratio.

Q.4 **20**

a) What are the advantages and disadvantages of pre-assignment and demand assignment multiple access system? Explain how they are implemented in TDMA.
b) Discuss FDMA-SCPC system.

Q.5 **20**

a) Discuss in brief the general configuration of earth station.
b) Explain on-board connectivity with beam scanning.

Q.6 Write shot note on **20**

a) OSI reference model for Satellite Network.
b) Concept and need of Laser satellite system.
c) Factor govern the design of Earth station.
d) Major techniques of attitude control.

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