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   5
      network

2. (a)   Explain middleware architecture of WSN   10
(b)   Explain HSDPA emphasizing its primary objectives and how it achieves   10
      performance improvement?

3. (a)   Give the detailed radio access network overview. Explain in detail   10
      functions of Node B and RNC also draw UTRAN logical architecture
(b)   List out the factors affecting size of the cellular network and the frequency 10
      planning. Discuss these factors in detail.

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   10
      traffic per subscriber. If there are 40 BTS sites, calculate voice and data
      traffic per cell.

      • 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}): 0.015
      • 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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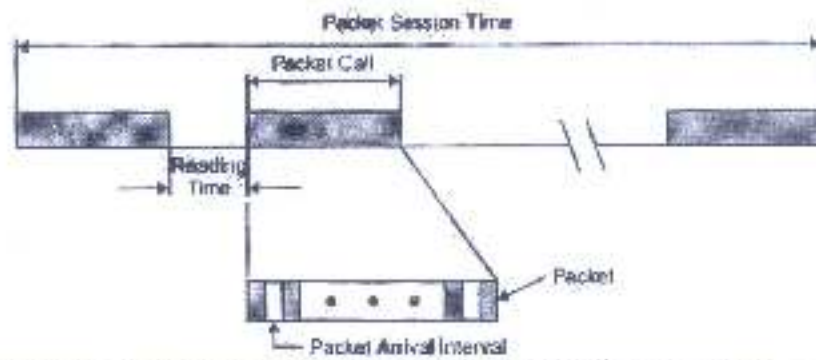
5. (a) Why network management design is critical issue in WSN? Explain. 10
   (b) What is localization of WSN nodes? Explain with examples centralized and 10
       distributed schemes in localization.

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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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

Q.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

Q.2 a) You are administering the 24000 workstations in an organization. You are pinging each station 10
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?

b) List and describe SNMP various commands with command syntax. 10

Q.3 a) With respect to ISO/OSI network management: Describe following terms: 10
i) Scoping and Filtering
ii) Linked Replies
iii) GDMO
iv) ACSE and ROSE

b) Draw a neat diagram of TMN functional architecture with interfaces. 10

Q.4 a) List and describe RMON2 MIB groups with their functions. 10

b) What is SNMP proxy server? 10

Q.5 a) Explain user security model (USM) of SNMPv3? 10

b) Draw and describe SNMP v1 message and SNMP v1PDU formats. 10

Q.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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Q.P.Code:13984

Max Marks: 80
Duration: 03 Hrs.

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 Stability circles and its importance in amplifier design.   (05)
    (B) Compare HMICs with MMICs.   (05)
    (C) Discuss microwave amplifier versus microwave oscillators.   (05)
    (D) List and explain various performance parameters of mixer.   (05)

2. (A) Derive the dispersion relation for open microstrip line.   (10)
    (B) Give limitations and criteria for the choice of substrate material in   (10)
         HMICS and MMICS.

3. (A) Derive the transducer power gain as: (10)

$$G_T = \frac{P_L}{P_{avg}} = \frac{|S_{21}|^2(1 - |\Gamma_s|^2)(1 - |\Gamma_L|^2)}{|1 - \Gamma_s \Gamma_{in}|^2 |1 - S_{22}\Gamma_L|^2}$$

    (B) Explain Green's Function and discuss its application.   (10)

4. Design an amplifier to have gain of 10 dB at 6 GHz using a transistor   (20)
    with the following s-parameters ($Z_0 = 50\ \Omega$) $S_{11} = 0.61 \angle -170°$, $S_{12} = 0$,
    $S_{21} = 2.24 \angle 32°$, $S_{22} = 0.72 \angle -83°$ Plot constant gain circles for Gs = 1
    dB and GL = 2 dB. Use matching sections with open circuited shunt
    stubs.

5. (A) For two port oscillator at steady state oscillation, prove that if: (10)
         $\Gamma_L \Gamma_{in} = 1$ then $\Gamma_T \Gamma_{out} = 1$.
   (B) Design a lange coupler with a center frequency of 4 GHz and with $N =$ (10)
         4, $C = 0.5$ and $Z_{0n} = 30\ \Omega$. Determine the line width and spacing required
         if an alumina substrate with $h = 0.635$ mm and $\varepsilon_r = 9.8$ is to be used.

6. (A) Give briefs of Balanced FET Mixers.   (10)
    (B) Discuss amplifier linearization methods.   (10)

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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Q.P. Code: 40105
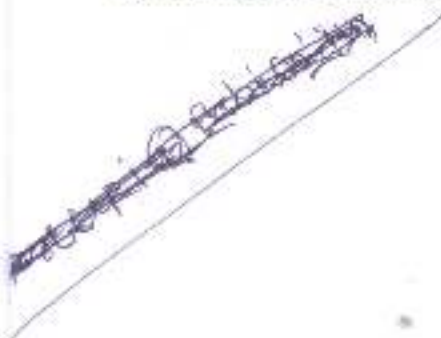
Duration: 3 hours

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.

    a. Explain Control bits (flags) in TCP header.   [5x4]
    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).