GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. a) Draw and explain GSM architecture.
   b) Explain the signal processing technique in GSM.
   c) Write down the name of the different channels used in GSM. 7 + 6 + 2

9. a) Explain Packet Switching and Circuit Switching.
   b) What is 4G ?
   c) Why are different coding mechanisms used in 2G and 2·5 G ?
   d) How does location update take place in GSM system ?
   e) What is 'Near and Far' problem in CDMA basic system ? 3 + 3 + 3 + 3 + 3

10. What is internet protocol ? Explain IP class and addressing. What do you mean by subnet mask ? Explain the concept of MIPV4 and MIPV6. What is the limitation of MIP ?
    1 + 3 + 1 + 7 + 3

11. a) Draw the GSM frame structure.
    b) How is security maintained in UMTS services ?
    c) What is meant by Frequency Reuse ?
    d) Explain the method which is applied to reduce interference in cellular communication system.
    5 + 3 + 3 + 4

12. Write short notes on any *three* of the following : 3 × 5
    a) Mobility management in wireless networks
    b) Handover
    c) UMTS Architecture
    d) Different access methods in wireless system
    e) Forward and reverse link in CDMA based IS 95 system.

2013

WIRELESS COMMUNICATION AND NETWORK

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following questions : 10 × 1 = 10

   i) Soft hand-off is used by
      a) GSM b) AMRS
      c) USDC d) CDMA.

   ii) The concept of "frequency reuse" technique is used in
      a) cellular system
      b) conventional mobile telephony
      c) paging system
      d) cordless telephony.

   iii) If the bandwidth of the transmitted signal is larger than the channel coherence bandwidth, then the signal could be severely influenced by
      a) Frequency selective fading
      b) Flat fading
      c) Fast fading
      d) Slow fading.

iv) Bluetooth is
  a) wireless LAN
  b) WAN
  c) short range infrared ad-hoc
  d) short range wireless ad-hoc LAN service.

v) Interference on voice channel usually causes
  a) missed calls b) blocked calls
  c) dropped calls d) cross talk.

vi) Mobile IP refers to
  a) mobility b) IP tuning
  c) IP within IP d) all of these.

vii) Free space propagation path loss is
  a) inversely proportional to frequency of transmissio
  b) directly proportional to frequency of transmission
  c) independent of frequency of transmission
  d) directly proportional to square of the frequency transmission

viii) Cells using the same set of frequencies are called
  a) Neighbouring cells b) Adjacent channel cell
  c) Co-channel cells d) Clusters.

ix) For a given frequency re-use ratio of 3. The cluster siz is
  a) 3 b) 4
  c) 7 d) 12.

x) The basic frequency region on GSM is
  a) 900 MHz b) 1800 MHz
  c) 1900 MHz d) all of these.

xi) Cordless phones can operate at
  a) 4·2 GHz b) 3·8 GHz
  c) 5·8 GHz d) 6·2 GHz.

xii) Data rate for 3G fast moving vehicle wireless network is
  a) 144 Kbps b) 384 Kbps
  c) 2 Mbps d) 1 Mbps.

xiii) In digital cellular telephony GSM uses 1800 MHz frequency band which uses uplink and downlink frequency. The difference of frequency 75 MHz is divided into
  a) 150 carrier channel b) 374 carrier channel
  c) 210 carrier channel d) 390 carrier channel.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. a) Describe the different mechanisms of multipath phenonmena.
  b) How is received power at the mobile station related with distance and path loss exponent ? 2 + 3

3. Describe the following methods in a typical call flow for GSM standard :
  a) Location update
  b) Call origination. 2 + 3

4. Define shadowing and log normal shadowing.

5. Define the following terminologies : 3 + 2
  a) Flat fading
  b) Frequency Selective Fading.

6. a) Compare amongst GEO, MEO and LEO satellites.
  b) Compare between FDMA and TDMA. 2 + 3

7. a) What is the frequency reuse concept useful in cellular communication ?
  b) How are locations of co-channel cells determined in a cellular system ? Explain with pictorial representation. 2 + 3