

CS/B.TECH/(ECE-New)/SEM-7/EC-701/2013-14

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 Question)

1. Choose the correct alternatives for any *ten* of the following:

10 x 1 = 10

- i) Soft hand-off is used by
 - a) GSM
 - b) ARMS
 - 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 transmission
 - b) directly proportional to frequency of transmission
 - c) independent of frequency of transmission
 - d) directly proportional to square of the frequency of transmission
- viii) Cells using the same set of frequencies are called
- a) Neighbouring cells
 - b) Adjacent channel cells
 - c) Co-channel cells
 - d) Clusters.
- ix) For a given frequency re-use ration of 3, the cluster size 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 x 5 = 15

2. a) Describe the different mechanisms of multipath phenomena.
- 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

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. 3 x 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 2.5G?
- 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 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 UTM 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 x 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.

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