



Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech(EIE)/SEPARATE SUPPLE/SEM-8/EC-802D/2011

2011

MOBILE COMMUNICATION

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 :

10 × 1 = 10

i) The unit of traffic intensity

- a) .erlang
- b) .nb/m
- c) dhm
- d) .lumen.

ii) The modulation refers to

- a) the distance between uplink and downlink fequency
- b) the separation between adjacent carrier frequency
- c) the process of changing the characteristic of carrier frequency
- d) the no. of unit per unit time.



- iii) The uplink frequency of GSM900 is
- a) 800-825MHz
 - b) 890-915MHz
 - c) 900-930Ghz
 - d) 935-960Ghz.
- iv) SIM means
- a) subscriber identity module
 - b) subsystem interface module
 - c) subscriber interference module
 - d) source interference manual.
- v) X.25 protocol is an example of
- a) Circuit Switching
 - b) Packet Switching
 - c) Message Switching.
- vi) If N is the number of cells per cluster, then frequency reuse of a cellular system is given by
- a) N
 - b) $1/N$
 - c) N^2
 - d) $N^{1/2}$.



vii) Bluetooth is to provide universal short-range wireless capabilities. It uses

- a) 2.4 Ghz
- b) 2.9 Ghz
- c) 3.8 Ghz
- d) 1.5 Mhz.

viii) The full name of MAC is

- a) Media Access Control
- b) Media Ability Control
- c) Meridional Accessibility Continuity.

ix) In CDMA the multiplexing technique used is

- a) TDMA, CDMA
- b) TDMA, FDMA, CDMA
- c) FDMA, SDMA
- d) TDMA, FDMA.

x) For total coverage round the earth the minimum no. of satellites needed is

- a) 4
- b) 7
- c) 3
- d) 2.



xi) The term Transponder is related to

- a) Satellite communication
- b) Fibre optic communication
- c) GSM communication
- d) CDMA communication.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. How is sectoring used to increase the channel capacity ?
What do you mean by grade of service ? $3 + 2$
3. With layered diagram discuss X.25 protocol.
4. a) Draw a TDMA multiframe structure beginning from TDMA time slot.

b) What is the use of trail bit, stealing bit and encrypted bit ? $2 + 3$
5. Briefly describe indoor propagation model.



6. a) Calculate the orbital velocity for Geosynchronous Satellite.
- b) What are the different advantages and disadvantages of Geosynchronous Satellite ? 2 + 3

GROUP – C

(Long Answer Type Questions)

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

7. Draw the diagram of GSM architecture and describe BSS, NSS, MSC, HLR, VLR, EIR. 5 + 10
8. a) Draw and explain the general model of spread spectrum digital communication system.
- b) Let the code for user a is $C_a = \langle 1, -1, -1, 1, -1, 1 \rangle$

code for user b is $C_b = \langle 1, 1, -1, -1, 1, 1 \rangle$

code for user c is $C_c = \langle 1, 1, -1, 1, 1, -1 \rangle$

From CDMA concept show that if there is a transmission from B and receiver attempts to recover A 's transmission then $S_a = 0$. 7 + 8



9. a) Starting with transmitting and received power of an antenna and applying general antenna relationship

$$G = \frac{4 \pi A_{eff}}{\lambda^2}$$

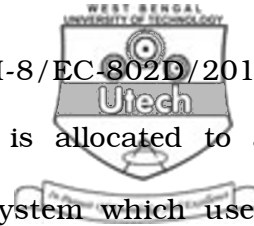
Discuss the link budget relationship and calculate the power that must be transmitted from geostationary satellite.

- b) Calculate the power that must be transmitted from a geostationary satellite to give a power of -116dBW ($2.5 \times 10^{-21}\text{ W}$) at a receiver on the earth. Assume $f = 10\text{GHz}$, $G_R = 40\text{dB}$, $G_T = 30\text{dB}$ and additional losses of 5dB . 6 + 9

10. a) Discuss about the different applications of wireless LAN.

- b) Discuss the strength and weakness of infrared LANs. 8 + 7

11. a) Define frequency reuse. From the consequence of frequency reuse discuss about Channel capacity and cluster.



b) If a total of 33Mhz of bandwidth is allocated to a particular FDD cellular telephone system which uses two 25Khz simplex channels to provide full duplex voice and control channels, compute the number of channels available per cell if a system uses

- i) four cell reuse
 - ii) seven cell reuse
 - iii) twelve cell reuse
- c) Differentiate between co-channel interference and adjacent channel interference. 5 + 3 + 7

