

Total No. of Questions : 12]

SEAT No. :

**P837**

**[4659]-96**

[Total No. of Pages : 3

**B.E. (E & TC)**

**MOBILE COMMUNICATION**

**(2008 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answer 03 questions from Section I and 3 questions from Section II.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 6) *Assume suitable data, if necessary.*

**SECTION - I**

**Q1) a)** Explain with neat diagram concept of cell splitting and cell sectoring. **[8]**

b) If a total of 33 MHz of bandwidth is allocated to a particular FDD system (cellular) which uses two 25 kHz simplex channel to provide full duplex voice & control channels. Compute the number of channels available per cell if a system uses.

i) 4 cell reuse

ii) 7 cell reuse

iii) 12 cell reuse

iv) 19 cell reuse

If 1MHz of allocated spectrum is dedicated to control channels. Determine number of voice and control channels in each cell for each system. **[10]**

OR

**Q2) a)** Explain Handoff mechanism in detail. With neat illustration explain handoff strategies. **[10]**

b) Define following terms in detail **[8]**

i) Co - channel interference.

ii) Adjacent channel interference.

iii) Grade of Service.

**P.T.O.**

- Q3) a)** Explain three basic propagation mechanism that impact propagation in mobile communication system. [8]
- b) A mobile is located at 2.5 km away from a base station and uses a vertical  $\lambda/4$  monopole antenna with a gain of 2.5 dB to receive signals. The E field at 500 meters from transmitter is measured to be  $10^{-3}$  volts/meter. The carrier frequency is 900 MHz. Find [8]
- Length of receiving antenna.
  - Find received power using two ray ground reflection model assuming transmitting antenna height 50 meters & receiving antenna height is 1.5 meter above ground.

OR

- Q4) a)** Explain the terms wrt. small scale fading: [8]
- Flat fading.
  - Frequency selective fading.
  - Fast fading.
  - Slow fading.
- b) A transmitter is transmitting signal at a frequency of 900 MHz for a vehicle moving 75 km/hr. Calculate the received carrier frequency if mobile is moving. [8]
- directly towards transmitter.
  - Directly away from transmitter.
  - In a direction which is perpendicular to the direction of arrival of transmitted signal.

- Q5) a)** Give comparison between QPSK & MSK digital modulation techniques. [8]
- b) Explain the concept of frequency & time diversity. [8]

OR

- Q6)** a) Explain following factors wrt to algorithms for equalization. [8]  
i) Rate of convergence.  
ii) Computational complexity & Numerical properties.  
b) Explain Band width efficiency bit rate & constellation diagram of BPSK, QPSK and 16 QAM. [8]

**SECTION - II**

- Q7)** a) Explain the working principal of SDMA with neat diagram. [8]  
b) Explain the techniques used by channel and Formant Vocoders. [8]

OR

- Q8)** a) Explain TDMA frame structure and state formula for efficiency of TDMA. [8]  
b) List the criterion for selection of speech codec in mobile communication system. [8]

- Q9)** a) Define Handover. With neat diagram explain steps involved in Intra-MSC handover. [8]  
b) Explain steps involved in call Termination from mobile to mobile. [10]

OR

- Q10)**a) With a neat diagram explain GSM frame structure. [8]  
b) Describe following term wrt. GSM. [10]  
i) Air - interface.  
ii) Physical and logical channels.

- Q11)**a) Explain in detail IS 95 forward channel structure. [8]  
b) Explain with neat block diagram the working of IS - 95 architecture. [8]

OR

- Q12)**a) Explain different logical channels for CDMA. [8]  
b) Explain evolution of CDMA 2000 from IS-95. [8]

