

Exam.Code:1005

Sub. Code: 7695

1129

M. E. (Information Technology)

First Semester

MEIT-104/114: Wireless and Mobile Communication

Time allowed: 3 Hours

Max. Marks: 50

*NOTE: Attempt five questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.*

x-x-x

I. Attempt the following:-

- a) Explain the role of Rake Receiver in mobile radio propagation?
- b) Name three diversity techniques adopted in wireless radio propagation?
- c) What is the frequency band of operation for Bluetooth Standard?
- d) What are different handoff strategies in cellular communication?
- e) Define Interleaving in context of mobile radio propagation? (5x2)

### UNIT – I

- II. a) Compare the AMPS / ETACS/USDC Radio Interface Specifications?  
b) Using first tier co channel cell geometry for Cluster size  $N=7$ , Prove the following relation:

$$S/I = 1/ [2 (Q-1)^4 + 2 (Q + 1)^4 + 2Q^4] \quad (2x5)$$

- III. a) Describe with the help of flowchart how a cellular telephone call is made?  
b) For given path loss exponent(a)  $n=4$  and (b) $n=3$  find the frequency reuse factor and the cluster size that should be used for maximum capacity. The  $S/I=15\text{dB}$  is minimum required for satisfactory forward channel performance of cellular system. There are 6 co channel cells in the first tier and all of them are at same distance from mobile. Use suitable approximations. (2x5)

- IV. a) What are different channel assignment strategies in cellular system design? With the help of diagram, explain how handoff occurs at cell boundary?  
b) Discuss GSM system architecture. Draw GSM frame structure alongwith different time slot data bursts. Explain how Signal Processing in GSM is done as different operations from speech input to speech output. (4,6)

### UNIT – II

- V. a) Compare TDMA/FDMA/SDMA in detail.  
b) What is the significance of Packet Radio and CSMA Protocols for power control? (6,4)

P.T.O.

(2)

- VI. a) Explain with the help of block diagram, the cellular radio architecture? Why IS-41 relies on the feature called autonomous registration?
- b) Explain the role of different Interface Units in the Metropolitan Area Network with packet switched architecture? (5)
- VII. a) Explain with the aid of block diagram, the working of communication system using adaptive equalizer at receiver. Also explain how a basic linear equalizer gets trained with adaptive algorithm that updates each weight.
- b) Prove that diversity is a powerful communication receiver technique to provide wireless link improvement at relatively low cost? Assume practical space diversity considerations. (2x5)

x-x-x