

ETI / sem VI / Real mobile comm<sup>n</sup> system / Dec 09

49 : 2ndExm.09-AM(a)

Con. 5176-09.

SP-6623

(3 Hours)

[ Total Marks : 100

N.B.: (1) Question No. 1 is **compulsory**.

(2) Attempt any **four** questions out of remaining **six** questions.

(3) Assume suitable data wherever **necessary**.

1. (a) Explain purpose of short code in both FL and RL CDMA. 5
- (b) Prove that the channel data rate in GSM is 270.833 Kbps. 5
- (c) Explain concept of cell dragging. 5
- (d) List and explain the factors influencing small scale fading. 5
2. (a) Explain the functions of following in GSM network :— 10
  - (i) Operation and Maintenance Centre
  - (ii) Base Transceiver Station (BTS)
  - (iii) Mobile Switching Centre
  - (iv) Base Station Centre (BSC)
- (b) Give the GSM frame structure. 10
3. (a) A hexagonal cell within a 4-cell system has a  $R = 1.387$  km. A total of 60 channels are used within the entire system. If the load per user is 0.029E and  $\lambda = 1$  call/ hour, compute for an Erlang C system that has a 5% probability of a delayed call. 10
  - (i) How many users per square kilometer will this system support ?
  - (ii) What is the probability that a delayed call will have to wait for more than 10 sec ?
  - (iii) What is the probability that a call will be delayed for more than 10 sec.?Given - For Erlang C, 5% probability with  $C = 15$ , Traffic intensity = 9 Erlangs.
- (b) Need of ST and SAT tone in AMPS system. 10
4. (a) Need of RAKE receiver in CDMA. 10
- (b) Explain advantages and disadvantages of CDMA. 10
5. (a) Define :— 10
  - (i) r.m.s delay spread
  - (ii) Maximum excess delay
  - (iii) Coherence bandwidth
  - (iv) Doppler spread and
  - (v) Coherence time.
- (b) For a 2-ray ground reflection model, derive the expression for received power at a distance 'd' from the transmitter. 10
6. (a) Describe in brief the radio aspects of IMT-2000. 10
- (b) Explain with block diagram the functional model of DECT. 10
7. Write short notes on any **two** of the following :— 20
  - (a) Iridium system
  - (b) Knife edge diffraction model
  - (c) Security in GSM
  - (d) Voice modulation in AMPS.