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10TE82

Eighth Semester B.E. Degree Examination, Dec.2018/Jan.2019

GSM

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions, selecting at least TWO questions from each part.

PART - A

- 1
 - a. With relevant figures, explain GSM PLMN structure. (06 Marks)
 - b. Explain the general objectives and services of GSM PLMN. (06 Marks)
 - c. Draw a neat diagram of a GSM reference model. Explain the various functional entities, indicating the interfaces used for their inter connections. (08 Marks)

- 2
 - a. With a neat block diagram, explain baseband frequency hopping implementation. (04 Marks)
 - b. Explain how advanced antenna technology helps to reduce interference in GSM. (08 Marks)
 - c. Consider a GSM system with the following data:
 - Coverage area = 80000 mile²
 - One-way system bandwidth = 12.5 MHz
 - Channel spacing = 200 kHz
 - Frequency reuse factor = 4
 - MS output power (w) = 800 mw
 - BS antenna gain (G_{bs}) = 20 dB
 - Receive cable/connector loss (L_c) = 2 dB
 - MS antenna gain (G_m) = 0 dB
 - Required S/I ratio = 12 dB
 - Information rate = 271 kbps
 - Receiver noise figure (F) = 7 dB
 - Propagation path-loss exponent $\gamma = 4$
 - One-mile path loss intercept (I₀) = 80 dBm
 - Lognormal fading margin (f_m) = 10 dB
 - KT = -174 dBm/Hz
 Calculate:
 - i) Minimum received power
 - ii) Maximum allowable path loss
 - iii) Cell radius in miles
 - iv) Number of cells required to cover the service area. (08 Marks)

- 3
 - a. With the help of neat diagram, explain various bursts used in GSM. (10 Marks)
 - b. Explain the data encryption method used in GSM. (06 Marks)
 - c. List and explain the types of location registration GSM supports. (04 Marks)

- 4
 - a. What is speech coding? Explain the time domain waveform coding. (06 Marks)
 - b. Write a short note on ITU-T standards. (06 Marks)
 - c. Explain with illustration, working of full rate vocoder. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and/or equations written eg. 42+8 = 50, will be treated as malpractice.

PART – B

- 5 a. Explain message flow diagram for call setup by mobile station. (10 Marks)
b. With neat block diagram, explain architecture of SMS and protocol stack for SMS. (10 Marks)
- 6 a. Describe briefly security algorithms for GSM. (06 Marks)
b. Briefly explain the wireless security requirement in a GSM. (08 Marks)
c. Write a note on Token-based challenge in GSM system. (06 Marks)
- 7 a. Discuss Teletraffic models. (06 Marks)
b. Explain planning of wireless network. (06 Marks)
c. Write a short note on spectral efficiency of a wireless system. (08 Marks)
- 8 a. What are the five TMN layers in 3010? Explain the pertinent three TMN layers. (08 Marks)
b. Explain simplified TMN physical architecture with necessary diagram. (06 Marks)
c. Explain with neat diagram GSM containment tree. (06 Marks)
