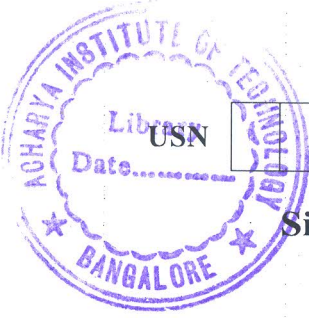# CBCS SCHEME

15EC651

Sixth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Cellular Mobile Communication

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Illustrate the concept of cellular frequency reuse with suitable schematic. **(06 Marks)**
   b. Define Brewster angle. Calculate the Brewster angle, θ_B for a wave impinging on poor ground, having a permittivity of $\varepsilon_r = 4$ at the frequency of 100 MHz. Also calculate the same for typical ground with permittivity of $\varepsilon_r = 15$. **(06 Marks)**
   c. Explain hata outdoor propagation model. **(04 Marks)**

OR

2 a. What are the different approaches used to expand the capacity of cellular systems? **(10 Marks)**
   b. If a transmitter produces 50W of power, express the transmit power in units of (i) dBm and (ii) dBW. If 50W is applied to a unity gain antenna with 900 MHz carrier frequency, find the received power in dBM at a free space distance of 100m from the antenna. What is P_r (10 km)? Assume unity gain for the receiver antenna. **(06 Marks)**

Module-2

3 a. Explain spread spectrum channel sounding system with a neat block diagram. What are the advantages and disadvantages of the same? **(10 Marks)**
   b. An urban RF radio channels are modeled on SIRCIM and SMRCIM statistical channel models with excess delays as large as 150 μs and microcellular channels with excess delays no larger than 40 μs. If the multipath bin is selected at 70. Calculate:
   (i) $\Delta\tau$
   (ii) The maximum bandwidth which two models can accurately represent
   (iii) If the indoor channel model with excess delays as large as 500 ns exists, calculate the values of (i) and (ii) **(06 Marks)**

OR

4 a. What are the physical factors influence small scale fading in the radio propagation channel? **(08 Marks)**
   b. Explain Rayleigh and Ricean Fading distribution with suitable equations. **(08 Marks)**

Module-3

5 a. With a neat diagram, explain GSM system architecture. **(06 Marks)**
   b. What are the logical and physical channels associated with GSM? Explain them in detail. **(10 Marks)**

OR

6 a. Explain the location registers and security related registers associated with GSM. Mention their functions. **(06 Marks)**
   b. Explain different kinds of bursts of GSM. **(10 Marks)**

Module-4

7 a. Explain the Multimedia Messaging Service Network Architecture (MMNSA) with a neat diagram. **(08 Marks)**

   b. Explain the location updating procedure used in GSM. **(08 Marks)**

OR

8 a. Explain the GPRS system architecture and interfaces with a diagram. **(08 Marks)**

   b. Explain the effects of Edge on the GSM system architecture. **(08 Marks)**

Module-5

9 a. Explain packet core network with suitable diagram of elements of the CDMA 2000 network. **(06 Marks)**

   b. Explain the generation of the CDMA reverse access channel and reverse traffic channel with relevant schematic. **(10 Marks)**

OR

10 a. Explain CDMA mobile originated call and BS originated call with suitable time line sketch. **(08 Marks)**

   b. What are the four system activities involved in a packet data session over CDMA 2000? **(08 Marks)**

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