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Sixth Semester B.E. Degree Examination, July/August 2021 Cellular Mobile Communication

Time: 3 hrs.

Max. Marks: 80

Note: Answer any FIVE full questions.

- 1 a. Explain frequency reuse concept with proper illustrative figure and necessary expressions. (08 Marks)
 b. Explain how subdividing a congested cell into smaller cells can expand the capacity of cellular systems. (08 Marks)
- 2 a. Explain free space large scale a propagation model used to predict received signal strength when the transmitter and receiver have a clear, unobstructed line-of-sight path between them with necessary expressions. (10 Marks)
 b. Find the median path loss using Okumura's model for $d = 50\text{km}$, $h_{te} = 100\text{m}$, $h_{re} = 10\text{m}$ in a suburban environment. If the base station transmitter radiates an EIRP of 1 KW at a carrier frequency of 900 MHz, find the power at the receiver. (Assume a units gain receiving antenna. $A_{mu}(900\text{ MHz}(50\text{ km})) = 43\text{dB}$. $G_{AREA} = 9\text{dB}$). (06 Marks)
- 3 a. Explain Doppler shift. Consider a transmitter which radiates a sinusoidal carrier frequency of 1850MHz. For a vehicle moving 60mph, compute the received carrier frequency if the mobile is moving i) directly towards the transmitter ii) directly away from the transmitter iii) in a direction which is perpendicular to the direction of arrival of the transmitted signal. (08 Marks)
 b. Explain the working of spread spectrum sliding correlator channel sounding system with the help of neat diagrams. Also, list its advantages and disadvantages. (08 Marks)
- 4 a. Explain Clarke's model for flat fading with relevant equations. (08 Marks)
 b. What is small scale fading? Explain the different types of small scale fading. (08 Marks)
- 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)
- 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)
- 7 a. Explain handover with respect to :
 i) Intracell and intercell
 ii) Internal and external. (08 Marks)
 b. Explain MMS network architecture with diagram. (08 Marks)
- 8 a. Explain GPRS system architecture and interfaces with diagram. (10 Marks)
 b. Write a short note on EDGE concept. (06 Marks)
- 9 a. Explain CDMA-2000 wireless system with the help of a neat diagram. (08 Marks)
 b. Explain the different types of CDMA handoff with neat diagrams. (08 Marks)
- 10 a. Explain CDMA mobile initialization and call establishment procedure with various states. (08 Marks)
 b. Explain the generation of the CDMA forward traffic/power control channel for 9.6 kbps. (08 Marks)

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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.