Roll No. ....   Total Pages : 03

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MOBILE COMMUNICATION

IT-454

Time : Three Hours]   [Maximum Marks : 100

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Why frequency spectrum is limited in mobile wireless communication ? Explain.   **8**

    (b) How does the concept of frequency reuse increase user capacity ? Illustrate with an example.   **12**

2. (a) Discuss the performance of GMSK modulation technique in mobile communication systems.   **8**

    (b) Assuming R_1 and R_2 as the radii of the macrocell and microcell respectively and K $= R_1/R_2$, show that the cluster size for the microcell can be reduced by K^2.   **12**

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Unit II

. (a) What is a Propagation Model ? How are these models utilized for designing the practical link budget ?   **12**

    (b) What do you understand by smart antenna ? With the help of an example, explain how these antennas help improve the performance of a mobile communication system ?   **8**

4. (a) Define and explain antenna tilt ? How is it fixed ? Explain.   **5**

    (b) With the help of a generalized block diagram, explain the concept of space diversity.   **5**

    (c) Give the mathematical analysis of maximal ratio combining as a diversity technique.   **10**

Unit III

5. (a) What is Digital Speech ? How human voice is converted into digital speech ? Explain. **8**

    (b) What are the different services offered by GSM ? Mention those.   **6**

    (c) Discuss the air-interface specifications of GSM standard.   **6**

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6. (a) What are different multiple access techniques ? How is CDMA implemented ?

    10

   (b) Discuss UMTS in detail. **10**

Unit IV

7. (a) What are LEO and MEO systems ? Discuss their merits and demerits. **8**

   (b) What is the operating principle of GPS ? Explain giving all the necessary mathematical analysis. **12**

8. Write short notes on the following :

   (a) American TDMA **6**

   (b) PHS **7**

   (c) WAP. **7**