

(3 Hours)

Marks: 80

NB: (1) Question No.1 is **compulsory**.

(2) Attempt any **three** out of remaining **five** questions

(3) Assume suitable data, if necessary.

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| Q1 | Attempt any four. | 20 |
| a | Draw and detail the GSM Reference Architecture. | 5 |
| b | What are the various factors influencing the Handoffs? | 5 |
| c | List and detail the fading effects due to multipath time delay spreading of signals. | 5 |
| d | What are the limitations of 3G? | 5 |
| e | What is the use of sectoring in Cellular Systems? | 5 |
| Q2 | a A total of 33 MHz bandwidth is allocated to a FDD cellular system with two 25 KHz simplex channels to provide full duplex voice and control channels. Compute the number of channels available per cell if the system uses (i) 4 cell (ii) 7 cell and (iii) 8 cell reuse technique. Assume 1 MHz of spectrum is allocated to control channels. Give a distribution of voice and control channels. | 10 |
| b | Draw and detail the Free Space Propagation model. Also list and discuss the fundamental phenomena responsible for signal propagation in a mobile Communication system apart from LoS communication. | 10 |
| Q3 | a Explain the need and the concept of Spread Spectrum modulation. | 10 |
| b | Differentiate between CDMA, TDMA and FDMA. | 10 |
| Q4 | a Detail the functions and types of Smart Antenna. | 10 |
| b | Draw and detail the general Authentication and Ciphering key generation Process in GSM. | 10 |
| Q5 | a With neat diagram explain the architecture of UMTS. | 10 |
| b | Detail the Radio Access Methods used by LTE and the advantages associated. | 10 |
| Q6 | a What do you mean by Indoor Propagation Model? Discuss the various losses encountered in it and along with the path loss model followed. | 10 |
| b | Write a Short note on a) IS 95 b) GPRS. | 10 |
