

Duration: 3hrs

[Max Marks: 80]

- N.B. : (1) Question No 1 is Compulsory.  
(2) Attempt any three questions out of the remaining five.  
(3) All questions carry equal marks.  
(4) Assume suitable data, if required, and state it clearly.

- 1** Attempt any FOUR [20]
- a Why the shape of the cell is hexagon ? [5]
  - b Differentiate between Rayleigh distribution and Ricean distribution [5]
  - c What is handoff ? state its types. Explain mobile assisted handoff. [5]
  - d Explain the merits and demerits of a millimeter bands [5]
  - e How power control is achieved in CDMA-2000 technology [5]
- 2** a If a transmitter produces 50 watts of power, express the transmitter power in units of [10]  
(a) dBm and (b) dBW. If 50 watts is applied to a unity gain antenna with a 900MHz carrier frequency, find a receiver power in dBm at a free space distance of 100m from the antenna. What is Pr (10km) ? Assume unity gain for the receiver antenna.
- b Draw UMTS network architecture with interfaces and explain. Give specifications. [10]
- 3** a What is MIMO? State and explain its types with suitable diagram. [10]
- b Discuss factors influencing small scale fading. [10]
- 4** a Consider a transmitter which radiates sinusoidal carrier frequency of 1850MHz. For a vehicle moving 60 mph, compute the received carrier frequency if the mobile is moving (a) directly towards the transmitter (b) directly away from the transmitter (c) in a direction which is perpendicular to the direction of arrival of the transmitted signal. [10]
- b Illustrate 3GPP core network architecture and explain functions of each block in detail. [10]
- 5** a Draw and explain GSM signaling protocol architecture [10]
- b Explain RAKE receiver . [10]
- 6** a What are the attributes of WCDMA system. Explain WCDMA channels. [10]
- b Write a note on (any TWO) [10]
- i) GSM frame structure
  - ii) PAPR in OFDM
  - iii) Beamforming
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