(3 Hours) **[Total Marks: 80]**

N.B.: (1) Question No. 1 is **Compulsory**.
(2) Attempt any **three** questions out of the remaining **five**.
(3) Each question carries 20 marks and sub-question carry equal marks.
(4) Assume suitable data if required.

1.	(a)	What is multicarrier Modulation? What is MIMO System?	**(5)**
	(b)	Discuss various channels of IS-95 CDMA system.	**(5)**
	(c)	Illustrate the concept of frequency reuse with proper diagram.	**(5)**
	(d)	What is Doppler shift? What are basic propagation mechanisms of Mobile Radio?	**(5)**
2.	(a)	Illustrate diversity multiplexing trade-off in MIMO OFDM Systems.	**(10)**
	(b)	Discuss Indoor and outdoor propagation model of Mobile Radio.	**(10)**
3.	(a)	Elaborate various fading effects and discuss types of small scale fading.	**(10)**
	(b)	Examine advantages and limitations of OFDMA technique	**(10)**
4.	(a)	Explain with block diagram transmitter and receiver of Direct Sequence spread spectrum Modulation technique.	**(10)**
	(b)	Illustrate Downlink and Uplink physical layer processing in 4G LTE.	**(10)**
5	(a)	Examine advantages and limitations of CDMA technique.	**(10)**
	(b)	Distinguish between Raleigh and Rician distributions of Mobile Radio Propagation.	**(10)**
6.	(a)	Analyze SIM in 5G with specifications and standardization.	**(10)**
	(b)	Discuss Channel assignment strategies and Handoff strategies.	**(10)**
