

Time: 3 Hours

Marks: 80

- N.B.: (1) Question No.1 is compulsory  
 (2) Write any three questions from Q.2 to Q.6.  
 (3) Draw a neat diagram wherever necessary.  
 (4) Assume suitable data if required and state it clearly.

- Q.1 Attempt **any four** 20
- A Explain power control process in WCDMA.
  - B Explain FHSS with diagram.
  - C How MIMO increases data rate.
  - D Explain large scale and small-scale fading.
  - E Explain RAKE receiver.
- Q.2 A Explain handoff process with diagram, also explain soft and hard handoff. 10  
 B Draw GSM architecture and explain working of it. 10
- Q.3 A Compare multiple access techniques SDMA, TDMA, FDMA and CDMA 10  
 B Explain following terms related to fading 10
- 1. Coherence BW
  - 2. Doppler spread
  - 3. Multipath propagation
- Determine the received signal power by a mobile at a distance of 10km from a 50W cell-site transmitter operating at a carrier frequency of 1900Mhz. The transmitter antenna gain is unity and receive antenna gain is 2. Assume free-space propagation conditions.
- Q.4 A Draw UTRAN block diagram and explain function of each block. 10  
 B Explain speech signal processing in GSM. 10
- Q.5 A Explain technologies enabling 5G. 10  
 B Draw and explain 3GPP LTE architecture. 10
- Q6 Write short notes (**any two**) 20
- A Explain reverse link traffic channel of IS 95 CDMA system.
  - B Software Defined Radio
  - C Compare 1G, 2G, 3G and 4G
  - D Explain architecture of EDGE technology, how EDGE technology enhances data rate.