

( 3 Hours )

[Total Marks : 80]

Please check whether you have got the right question paper.

- N.B.:** 1) Question No. 1 is compulsory.  
2) Attempt any three from remaining questions.

1. a) Define following terms. (05)  
i) Control channel  
ii) Forward channel  
iii) Hand-off  
iv) Reverse channel  
v) Page
- b) What is frequency Re-use? Derive the relationship between capacity C and cluster size N. (05)
- c) List and discuss factors influencing small scale fading. (05)
- d) Explain soft-hand-off and power control in 3G. (05)
2. a) For given path loss exponent (a)  $n = 4$  and (b)  $n = 3$ , find the frequency re-use factor and the cluster size that should be used for maximum capacity. The S/I ratio of 15db is minimum required for satisfactory forward channel performance of a cellular system. There are six co-channel cells and all of them at same distance from mobile use suitable approximations. (10)
- b) Draw the block diagram and explain GSM architecture in detail indicating all the interfaces. (10)
3. a) Explain IS-95 forward and reverse channel structure in details. (10)
- b) Describe GSM frame structure in detail. (10)
4. a) Compare IS-95, W-CDMA and CDMA 2000 with respect to channel Bandwidth, chip rate, modulation schemes, data rates and frame size. (10)
- b) Sketch UMTS Network Architecture and explain it in detail. Give in brief Features and services provided by UMTS. (10)
5. a) Draw and explain 3GPP LTE architecture and also discuss frames and slots in LTE. (10)
- b) Explain the concept of MIMO with respect to 4G technology. (10)
6. Write short notes on **Any Two**:- (20)  
a) Indoor propagation Models  
b) Rake Receiver  
c) Software defined radio