

EXTC/MC/VII/CBGS | 01.12.2016

Mobile Communication



Q.P. Code : 788602

(3 Hours)

[Total Marks : 80

N.B. : (1) Question No.1 is compulsory.

(2) Solve any 3 questions from remaining questions

(3) Assume suitable data if necessary stating it clearly.

1. (a) Explain the advantages of Software Defined Radio Communication Systems. 5
- (b) Compare between FCA and DCA channel assignment strategies. 5
- (c) What is Soft Handoff? 5
- (d) What are the bandwidths and chip rates used in WCDMA and how they are compare with cdmaOne? 5
2. (a) Consider a cellular system with S/I ratio of 18 dB. The frequency reuse factor is $N = 7$, calculate the worst case for signal-to-co-channel interference ratio. Is the frequency reuse factor 7 still being acceptable? If not, what is it? 10
Assume path-loss exponent as 4 in a mobile radio environment
- (b) With respect to trunking theory describe following terms: 10
- Busy Hour
 - Traffic Intensity A,
 - Average call arrival rate & Average call duration H.
 - Erlang-B System & Erlang-C System.
 - Trunking efficiency & Grade of Service (GOS)
3. (a) Describe GSM frame structure. 10
- (b) Why is power control used in cdma2000 and WCDMA? 10
4. (a) Draw a neat diagram of UMTS system architectures with interfaces. Explain in details. 10
- (b) What is Multi path Path Signal Propagation and Rake Receiver. 10

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5. (a) Draw a neat diagram of LTE Network Architecture and explain in details. **10**
- (b) Why LTE uses OFDMA for DL & SC-FDMA (Single Carrier FDMA) for UL? **5**
- (c) How do we use space-time block code (STBC) and space-time trellis code (STTC) **5**
- 6: (a) Compare between 3GPP/LTE and Advanced LTE. **5**
- (b) Describe the Knife-edge Diffraction model. **5**
- (c) In a cellular system, if carrier frequency $f_c=900\text{MHz}$ and mobile velocity is 70km/hr . Compute the received carrier frequency if the mobile is moving **10**
- [i] directly towards the transmitter,
 - [ii] directly away from the transmitter
 - [iii] In a direction which is perpendicular to the direction of arrival of the transmitted signal.
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