EXTC. VII 01/12/16

M C

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**
i. Busy Hour
ii. Traffic Intensity A,
iii. Average call arrival rate & Average call duration H.
iv. Erlang-B System & Erlang-C System.
v. 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 fc=900MHz 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.
