Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

SEVENTH SEMESTER B.Tech. (E & C) DEGREE END SEMESTER EXAMINATION
NOV 2017
SUBJECT: SPREAD SPECTRUM COMMUNICATION (ECE - 4012)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates
- Answer **ALL** questions.
- Missing data may be suitably assumed.

1A. Obtain the expressions for the received signal starting from the equation for the QPSK direct sequence spread spectrum modulated signal Also draw the transmitter and receiver block diagrams

1B. With the help of relevant diagrams, illustrate slow and fast frequency hop for a 4-ary FSK system with the data bandwidth equal to 10kbps.

1C. Mention any two benefits of Spread spectrum communication system

(5+3+2)

2A. With the help of relevant diagrams, derive an expression for the processing gain of a BPSK direct sequence spread spectrum communication system.

2B. Find the generator polynomial for a primitive polynomial represented as octal number 67. Draw the Galois and Fibonacci configuration for the same.

2C. Draw the PSD plots of jammer waveforms versus a communicator's FH/MFSK tone for the transmission of symbols G_1,G_2 in the following cases:

a) Partial-band noise b) Stepped noise

(5+3+2)

3A. Draw the block diagrams of a DS-CDMA Tx/Rx system with BPSK data modulation, assuming a single multipath interference. With the help of relevant expressions, show that the code-correlation receiver eliminates the multipath interference completely

3B. What are Walsh codes? Discuss the generation of Walsh codes and its properties. Mention one of its application in CDMA

3C. Find the hopping bandwidth required to achieve an antijam margin of 20 dB in a FHSS scheme, if the data rate is 1000kbps, $EIRP_T$=30dBW ,$EIRP_J$=60dBW and $E_B/J_{O\ REQD}$=10dB

(5+3+2)

4A. Discuss the factors affecting the maximum allowable number of users per cell in the case of CDMA.

4B. Discuss the properties of Long and Short codes in IS-95.

4C. Mention the names of channels used in the forward link of IS-95.

(5+3+2)

5A. Discuss briefly any 5 salient features of CDMA 2000 standard for 3G wireless communication

5B. Draw the block diagram of a direct sequence parallel search acquisition scheme and discuss the salient features of the same

5C. Draw the block diagram of a reverse channel used in IS-95.

(5+3+2)