Reg. No.

MANIPAL INSTITUTE OF TECHNOLOGY

(A constituent unit of MAHE, Manipal)

SECOND SEMESTER M.TECH. (DEC) DEGREE END SEMESTER EXAMINATION **APRIL/MAY 2019**

SUBJECT: ADVANCED DIGITAL SIGNAL PROCESSING (ECE - 5202)

TIME: 3 HOURS

Instructions to candidates

- Answer ALL questions.
- Missing data may be suitably assumed. •
- 1A. What are the benefits of Multirate systems? Using mathematical notations discuss the time domain and frequency domain interpretations of decimator and interpolator.
- 1B. Explain the working of transmultiplexer in detail.

(6+4)

MAX. MARKS: 50

- 2A. Explain the following:
 - i. Tunable filters
 - ii. IFIR method
- Explain the commutator model used to visualize the polyphase implementation. 2B.

(6+4)

- 3A. Using the diagrams and mathematical expressions derive the Widrow-Hoff LMS adaptation algorithm. Comment on the role of adaptation parameter.
- Explain the use of doubly complementary filters in digital audio. 3B.

(6+4)

- 4A. With the help of neat diagram and mathematical expressions explain the working of Adaptive channel equalizer.
- Using the basic DSP block sets draw the block diagram of adaptive linear combiner with 4B. two weights. Derive the equation used for this implementation.

(5+5)

- 5A. What is cepsrtal analysis? Explain the method of estimation of fundamental frequency from voiced speech segment by cepstral analysis.
- 5B. Propose a homomorphic system where signals are combined using convolution operation.

(6+4)

