

Code: EC5T3

III B.Tech - I Semester – Regular Examinations - November 2014

**DIGITAL COMMUNICATIONS
(ELECTRONICS & COMMUNICATION ENGINEERING)**

Duration: 3 hours

Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Discuss the companding in PCM systems. 7 M

b) Explain the basic principle of DPCM. Draw and explain the transmitter and receiver of DPCM. 7 M

2. a) What is DPSK? Explain the DPSK Transmitter in detail. 7 M

b) What is BFSK? Derive an expression for the spectrum of BFSK and sketch it. 7 M

3. a) What is an optimum filter? Obtain a transfer function of an optimum receiver. 7 M

b) Obtain the probability of error for PSK. 7 M

4. a) What is spread spectrum? Explain the synchronization in spread spectrum system. 7 M
- b) Explain the direct sequence spread spectrum technique in detail. 7 M
5. a) What is entropy? State and prove the properties of entropy. 7 M
- b) An event has a six possible outcomes with the probabilities $1/2, 1/4, 1/8, 1/16, 1/32, 1/32$. Find entropy of the system. Also find the rate of information if there are 16 outcomes per second. 7 M
6. a) Determine the Huffman coding for the following message with the probabilities of 0.4, 0.15, 0.15, 0.15, and 0.15. Find the efficiency. 7 M
- b) Explain the bandwidth –S/N Trade Off. 7 M
7. a) Design an encoder for the(7,4) binary cyclic code generated by $g(x)=1+x+x^3$ and verify its operation using message vector (0 1 0 1) 7 M
- b) Write short notes on BCH codes. 7 M

8. a) Explain the decoding of convolutional code using viterbi algorithm. 7 M
- b) Construct the trellis diagram for the encoder shown in figure-1, assuming a message sequence of length 5 . Trace the path through the trellis corresponding to a message sequence 10111..... 7 M

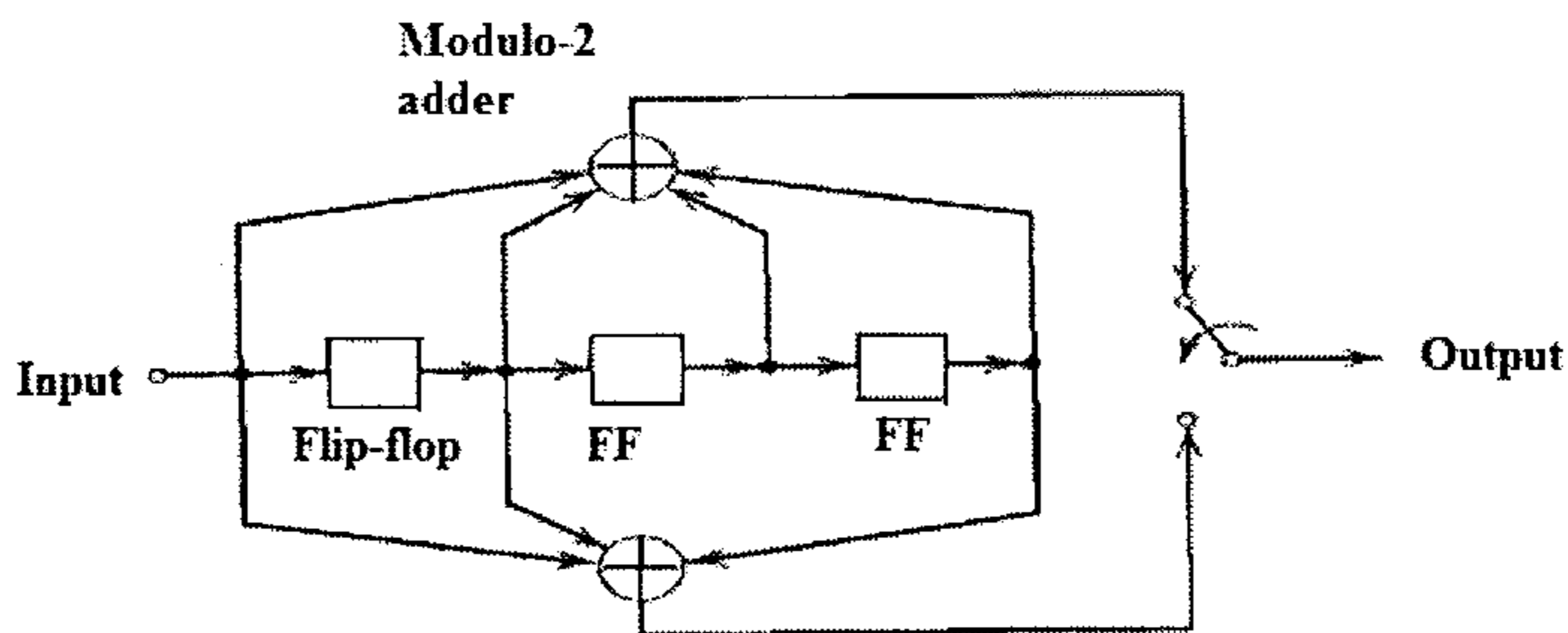


Figure-1