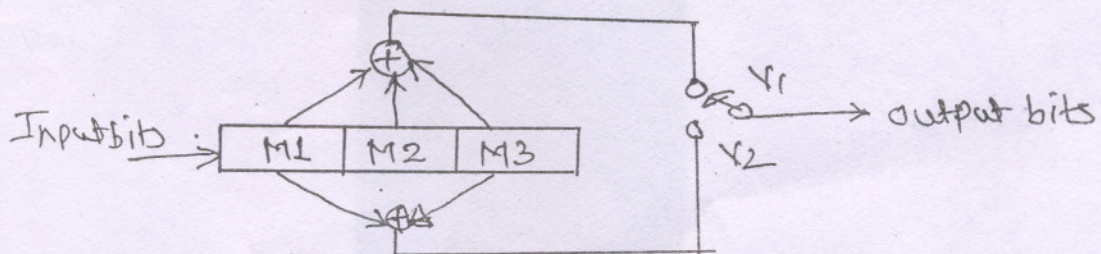


- N.B. :** (1) Question No. 1 is **compulsory**.
 (2) Attempt any **four** questions out of remaining **six** questions.
 (3) **Figures** to the right indicate **full marks**.

- Q1(a) Compare the following : 12
 i) M-ARY PSK with M-Ary FSK
 ii) BPSK and DPSK
 (b) Define signature authentication process using public key cryptosystem. 8

- Q2(a) Sketch the block diagram of QPSK system and explain the working by giving relevant expressions at the output of each block. 6
 (b) Can differential encoding be used for QPSK? If so then explain the advantages. 4
 (c) Determine an expression for the correlation function of a square wave having values 1 and 0 and a period T. 10

- Q3(a) For a convolution encoder of rate $\frac{1}{2}$, $k=3$ as shown in figure, obtain- 12
 1) State diagram
 2) Trellis diagram
 3) Tree diagram
 4) If the received signal at the decoder for eight message bits is:
 $V = (00\ 01\ 10\ 00\ 00\ 00\ 10\ 01)$
 Trace the decision on code tree diagram and find out message bit sequence.



- (b) An NRZ waveform consists of alternating 0's and 1's. The bit interval is $1\mu s$ and the waveform makes excursions between $+1V$ and $-1V$. The waveform is transmitted through an RC network filter. With time constant of $1\mu s$. Draw the output waveform and calculate numerical values of all details of the waveform. 8

- Q4 (a) Discuss the various types of losses encountering in the link design of digital communication system. 10

- (b) What is Gaussian probability density function. Derive its cumulative distribution in terms of complimentary error function. 10

- Q5 (a) Explain in detail DPCM. 10
 (b) Explain the following terms- 10
 (i) CDF (ii) PDF

- Q6(a) What is matched filter in a communication system? Enumerate its Properties and derive expression for probability of error of matched filter. 10

- (b) What is a correlation receiver in a coherent communication system? 10
 Derive an expression for the output S/N ratio. Is it an optimum filter? Justify.

- Q7 Write short notes on (any Four) 20

- (a) Uniform and Non Uniform quantizers.
 (b) Companding in PCM.
 (c) Data encryption standard algorithm.
 (d) Run length coding.
 (e) Lempel Ziv codes.