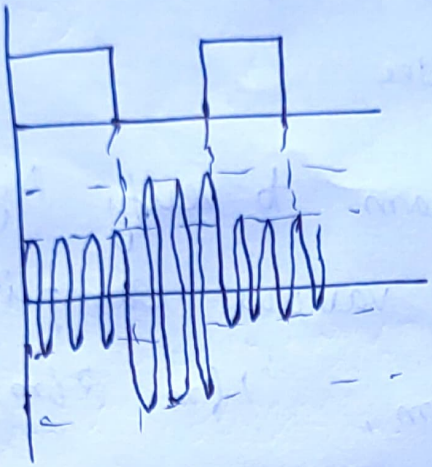
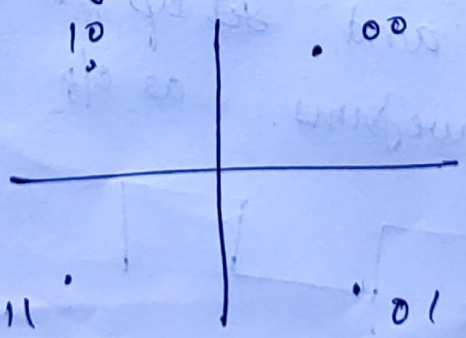
1. Design and set up a circuit to obtain the foll:- o/p waveform. $1/T = f$, $f = 500\,kHz$



2. If the hexadecimal equivalent of 'EBCDIC code for 'O' is 06' & 'K' is 02. Simulate the modulation scheme ~~for~~ the to transmit the word 'OK'. The modulation scheme should have a bit error rate $P_e = Q\sqrt{2E_b/\eta}$

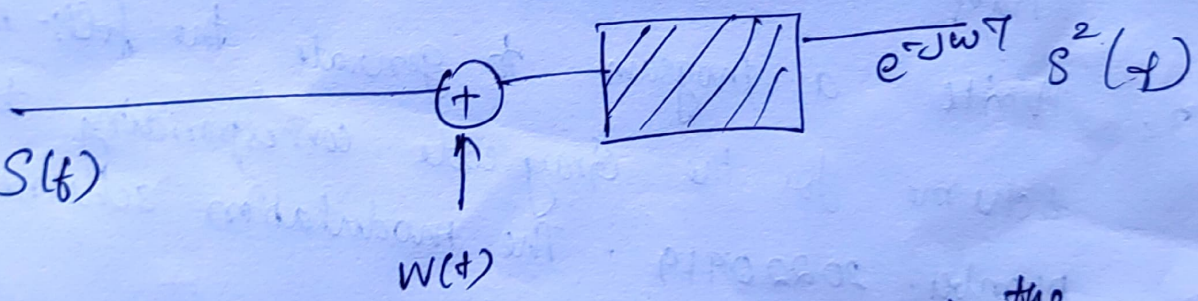
3. Write a program to generate the foll:- modulation scheme for the Gray code corresponding to the number. 20220919. The modulation scheme has a constellation diagram



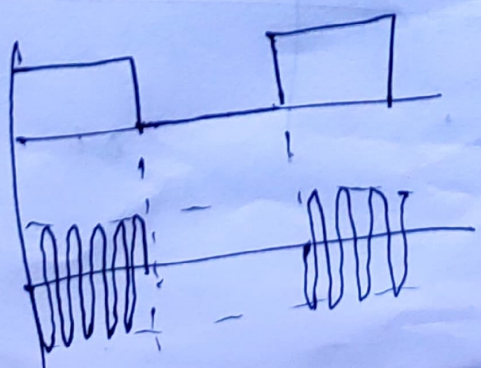
4. A triangular wave of amplitude 4V is transmitted using binary PCM. Generate a PCM waveform for at least 2 cycles of input. Assume the sample rate to be 8 samples per second with samples at $t = \pm 1/8, \pm 3/8 + \ldots$ sec

5. Simulate a program to verify Nyquist sampling theorem. Try for various sampling frequencies $f_s = 0.5 f_m$, $0.75 f_m$, $1 f_m$, $2 f_m$, $4 f_m$

6. Write a program to simulate the unknown box of given system where $s(t)$ is any commonly used signal & $w(t)$ is a random signal with zero mean & a known variance.



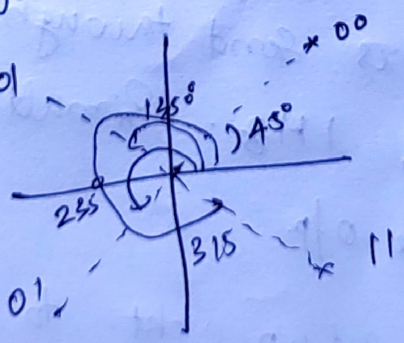
7. Design and set up a ckt to get the following waveforms as o/p



8. Write a program to plot the signal to quantization noise ratio for a sine wave of amplitude 5V at no. of levels, 2, 4, 8, 16, 32, 64, 128.

9. A binary sequence of [01 10 11 01] uses RZ unipolar signalling. This is send via an AWGN channel. Reconstruct the message. Then count the no. of errors. Take the same bit stream transmit it using AWGN channel. Reconstruct the sequence. Count the no. of errors. Write your inference.

10. You are asked to transmit your year of birth using the modulation scheme specified by the signal constellation. Write a program for the same.



11. Simulate a program to show that even if the quantization levels are increased, it will not affect a square wave. Use antialiasing filter.

12. Simulate a system whose o/p signal is proportional to shifted version of ACF of its i/p.

$$S_o(t) = R_s(t-\tau)$$

13. Design and set up a ckt whose o/p ~~signal~~ frequency instaneously changes according to its i/p frequency

14. Design and set up a modulation scheme which uses 10.6 MHz as intermediate freq.

15. Design and set up a ckt to get the foll:- o/p ean.

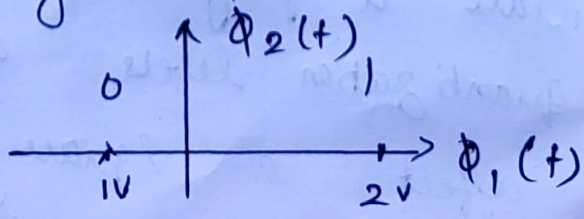
$$f_{out}(t) = f_1 + K \cdot A_2 \cos(2\pi f_2 t)$$

1st signal is $S_1(t)$ = Square wave

2nd signal is $S_2(t) = A \sin 2\pi f_2 t$

11. A binary sequence of [1 0 0 1 0 1 1 0 1 0] uses NRZ unipolar signalling for transmitter. This is send via an AWGN channel. At the receiver it is send through an LPF. with cut off 1 Hz. Simulate the system & show the o/p

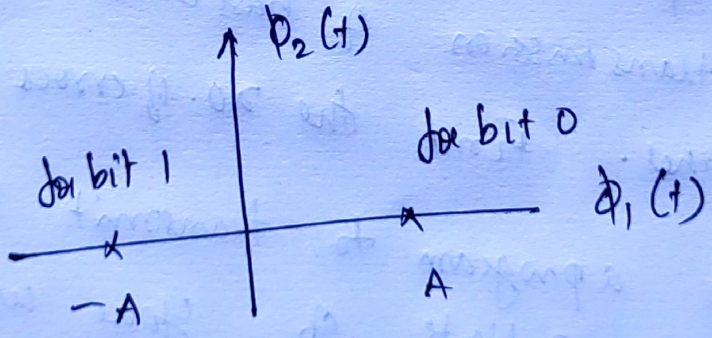
17. Design and set up a ckt to obtain the foll:- Signal space ~~diagram~~ represented modulation scheme



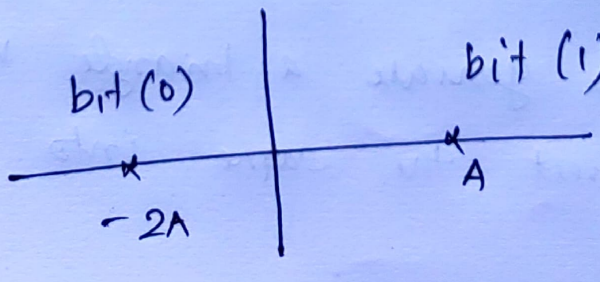
18. Design and set up a ckt to obtain a modulation scheme which use 88 to 108 MHz for broad casting

19. Generate a string of message bits for all even nos upto 6 for at least 4 cycles. Simulate the base band via AWGN channel. Check whether the fn is error free.

20. Write a program to convert the bell:- no $(D706F6)_H$ into binary, & to transmit the o/p via a digital modulation scheme whose signal space representation is as shown.

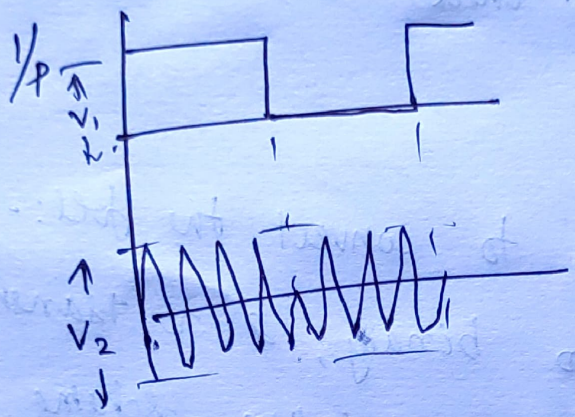


21. Design and set up a ckt to obtain a modulation scheme with bell: Signal space representation



22) Write a program to generate a triangular wave of $2V_{PP}$, then offset it by $+2V$. Convert it to 8 levels of amplitude, Calculate SNR

23) Design & set up a ckt to obtain a modulation scheme with following i/p & o/p waveforms

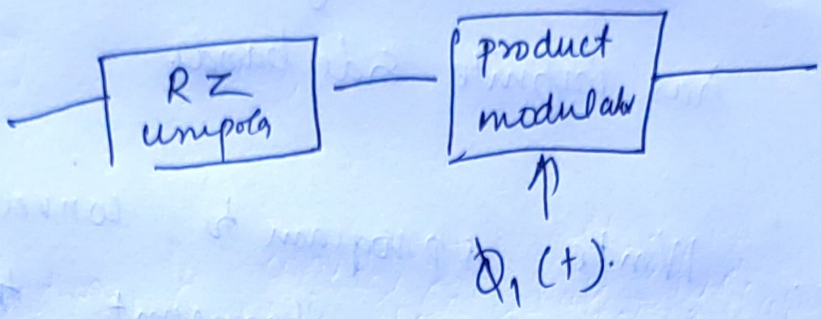


24) Generate a string of message bits for all odd no: upto 7, for atleast 5 cycles. Simulate the transmission of baseband via an AWGN channel. Find the no. of errors

25) Write a program to transmit the BCD equivalent of last 3 digits of your university roll no. using an M-ary phase modulation where M = 2.

26) WAP to generate a triangle wave of $5V_{PP}$. Then convert the same into 5 voltage level of amplitude. Find SNR.

27) Write a program to simulate the foll:- blocle diagram



28) Design and set up an analog modulation ckt for which the receiving & transmitting antenna "should see each other!"

29) Write a program to compare the performance of Many PSK modulation for M=2 & M=4.

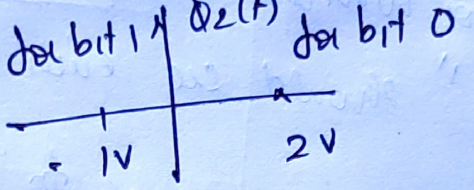
30) Design and set up a digital modulation ckt which uses antipodal signaling to represent binary numbers

31. Write a program to convert the BCD No 1923 into X-SS 3 code & then perform QPSK modulation for the same.

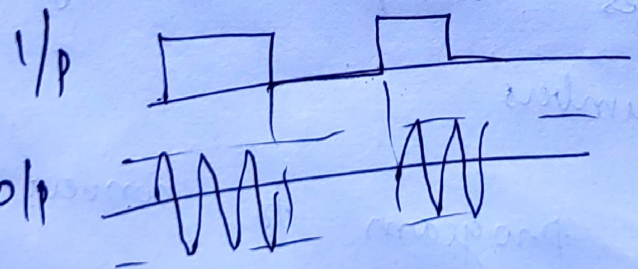
32. Write a program to find SNR of $x(t) = A \sin(2\pi f t)$ with step size $\Delta = 0.5V$ & $\Delta = 1V$.

33. Design and set up a ckt to obtain an ~~xxxxx~~ analog modulation scheme which has infinite side bands

34. Write a program to convert $(555)_0$ into binary and transmit the same using AWGN channel using a modulation scheme as per signal constellation



35 Design and set up a ckt to obtain the foll:- modulation scheme o/p.



36. Design and set up a software defined radio for a frequency of 102.4 MHz.