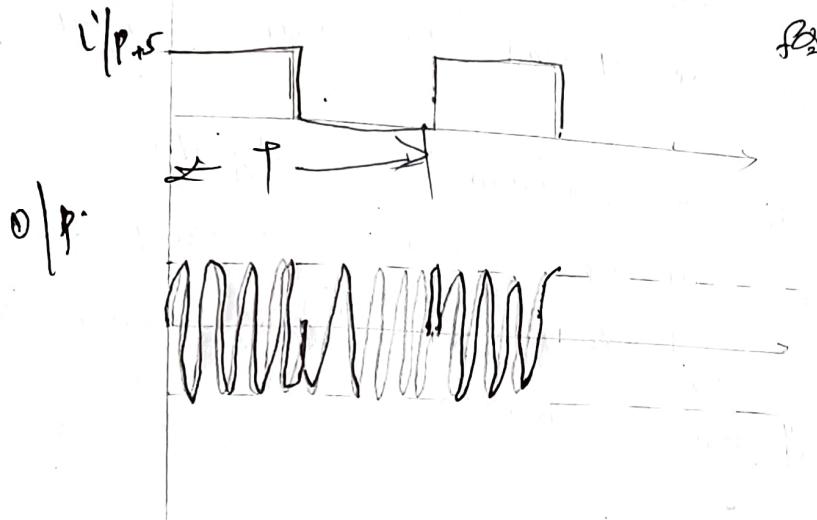


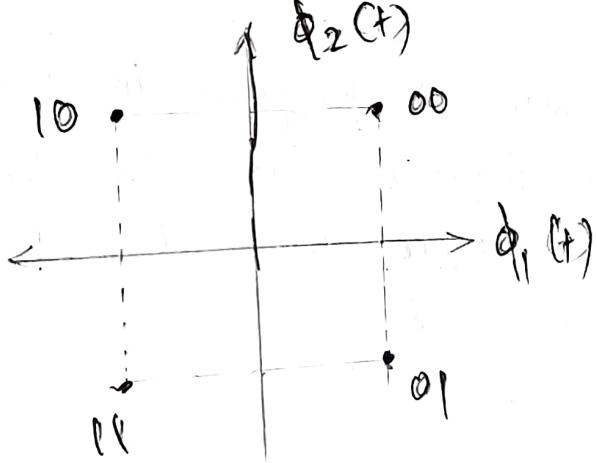
1. Design and set up a circuit to obtain the foll:- o/p waveform. Make necessary assumptions



2. If Hexadecimal equivalent of EBCDIC code for letter 'O' is '86' and 'K' is D2. Simulate the digital modulation scheme for the word 'OK'. The modulation scheme should have a digital modulation scheme. Bit Error Rate $P_e = Q \left[\sqrt{2E_b/N_0} \right]$

3. Write a program to generate Gray code scheme for the number corresponding to the number

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(2)

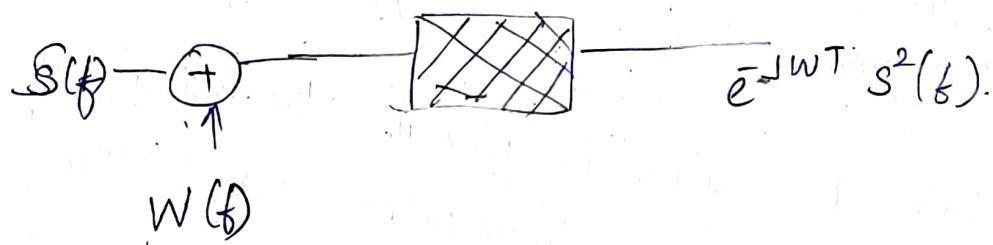
B 4

A triangular wave of amplitude $4V$ is transmitted using binary PCM. Write a program to generate a PCM waveform for at least two cycles of output. Generate a PCM waveform for at least two cycle of input.

5. Simulate a program to verify Nyquist sampling theorem. Try for various sampling frequencies $f_s = 0.5 \text{ fm}$, 0.75 fm , 1 fm , 2 fm , 4 fm . Display your observation.

(a)

6. Write a program to simulate black box given so to obtain the given O/p. when $s(t)$ is common signal & $w(t)$ is some random signal with zero mean and variance σ_n^2

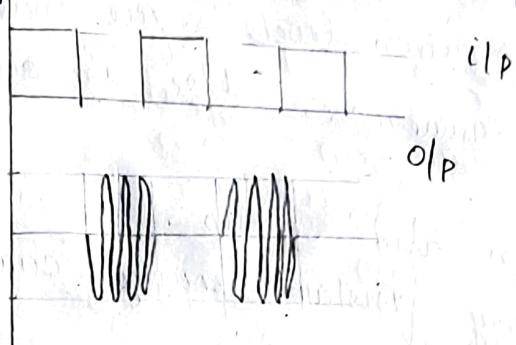


(10)

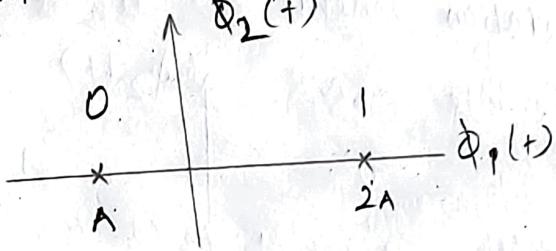
7. Write a program to plot the signal to quantization noise ratio for a sine wave of amplitude $5V$ at a no. of levels $2, 4, 8, 16, 32, 64$ & 128 .

(3)

- Design and set up a circuit to obtain the foll. waveform.



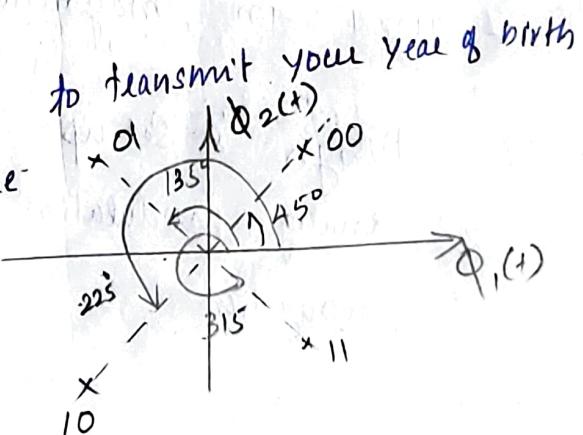
- (a) Write a program to simulate the foll. modulation scheme given below for the hexadecimal no: 'D3'



- (b) A binary sequence of [010101101] uses RZ unipolar signalling. This is send via an AWGN channel. Reconstruct the message as binary signal and count the no. of errors. Take the same bit stream and transmit it using BPSK in AWGN channel. Reconstruct the binary signal.

Count errors. Write your inference.

11. Write a program using the modulation scheme



- (A)
12. Simulate a program to show that even if the quantization levels are increased, it will not off a square wave. Use an anti aliasing filter.
13. Design and set up a modulation circuit whose frequency instantaneously changes according to input amplitude.
14. Design and set up a circuit to obtain a ~~design~~ modulation scheme with following signal constellations
-
15. Simulate a system whose o/p signal is proportional to shifted version of ACF of c/p $s(t)$ i.e. $R_s(t-T)$.
16. Design and set up a modulator circuit which was used in magnetic Tape Recording earlier. (~~analog~~)
17. Design & set up a ckt to obtain an analog modulation scheme which uses LOS propagation.
18. Write a P three digits phase mod
19. Design a scheme n
20. Design an modulation
21. Design four w/
22. Design the hel distance
23. A binary unipolar channel with c/f

(5).

18. Write a program to transmit the BCD equivalent of last three digits of your university register no. using M-ary phase modulation where $M = 2$.

19. Design and set up an ~~modulati~~ analog modulation scheme which uses 10.6 MHz as intermediate frequency.

20. Design and set up a circuit to obtain a broadcasting modulation scheme which transmits only in 80km radius.

21. Design & set up a ckt to get the foll:- outputs.

$$f_{\text{out}}(t) = f_1 + kA_2 \cos(2\pi f_2 t)$$

where 1st signal is $s_1(t)$ - a square wave.

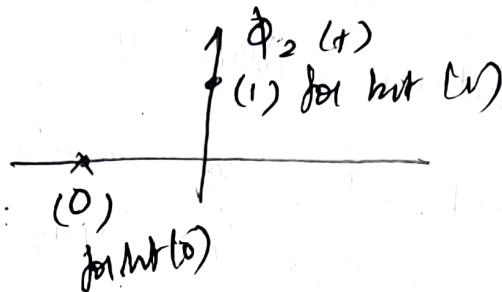
$s_2(t) \rightarrow A \sin 2\pi f_2 t$

22. Design and set up a modulation scheme in which the height of the antenna affects the transmission distance.

23. A binary sequence of $[1001011010]$ uses NRZ unipolar signalling. This is sent via an AWGN channel. At the receiver it is send through an LPF with cut off 10 Hz. Simulate the system and show the o/p.

(6)

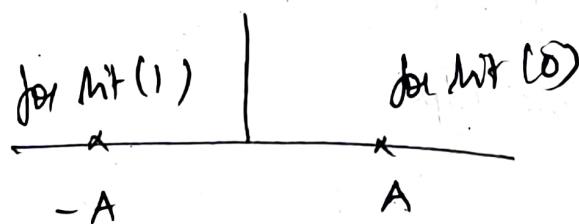
24. Design and set up a circuit to obtain a waveform with foll:- signal constellation



25. Write a program to generate a triangular wave of $2V_{pp}$. Then offset it by $+1V$. Convert it into 8 different levels of amplitude. Calculate SNR &

26. Generate a string of message bits for all even numbers upto 6 for atleast five cycles. Sim the base band signal via AWGN channel. Check whether the function is error free.

27. Write a program to convert the foll:- no $(D7\ 06\ F6)_H$ into binary & transmit the opp via a modulation scheme whose signal space representation is as shown in fig



29.

30

31.

32.

(7)

28. Design and set up a ckt to obtain a modulation scheme uses 88 to 108 MHz for broadcasting

29. Generate a string of message bits for all odd numbers upto 7 for at least 5 cycles. Simulate the txin of bandwidth via an AWGN channel. Find the no. of errors.

30. Write a program to transmit the BCD equivalent of last three digits of your University Register No using an M-ary Phase modulation for $M=2$.

31. Write a program to simulate the foll:-
block diagram



32. Design and set up an analog modulation ckt for which the receiving antenna & transmitting antenna should see each other

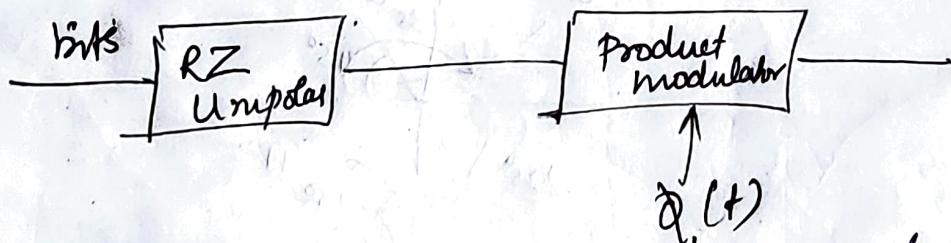
(7)

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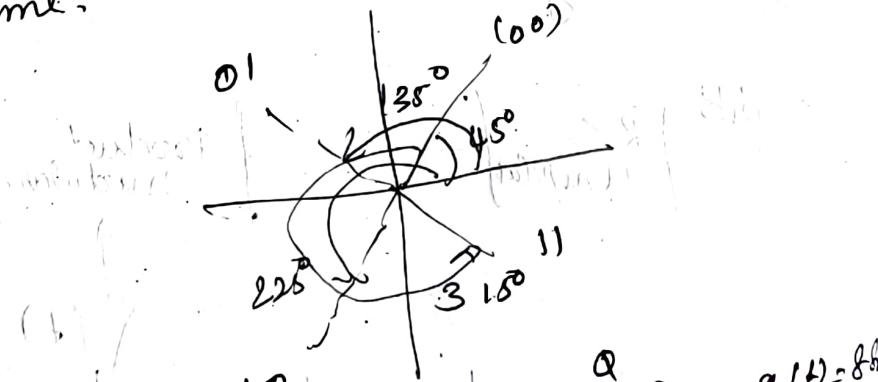
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33. Write a program to compare the performance
of Many PSK modulation for $M=2$ & $M=4$ (8)

34. Design and set up a 2-ary digital modulator which uses antipodal signalling to represent binary nos.

35. Write a program to convert BCD No. into X-SS3 code & perform QPSK mod for the same.

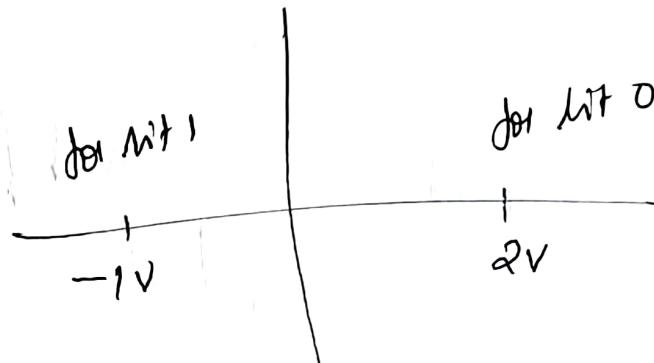
36. You are asked to transmit your year of birth using the module scheme specified using the signal constellation. Write a program for the same.



37. Write a program to find SNR of $a(t)=8t$ with step size $\Delta=0.5$ & $\Delta=1V$.

8. Design and set up a circuit to obtain a modulation scheme where the no. of sideband is infinite.

39. Write a program to convert $(555)_{10}$ into its binary equivalent & perform modulation as per the signal constellation given



40. Design and set up a circuit to obtain the foll. waveform.

