

B. Tech. in Electronics & Communication Engineering, Semester VI

Roll No.....

Time: 3.0 hours

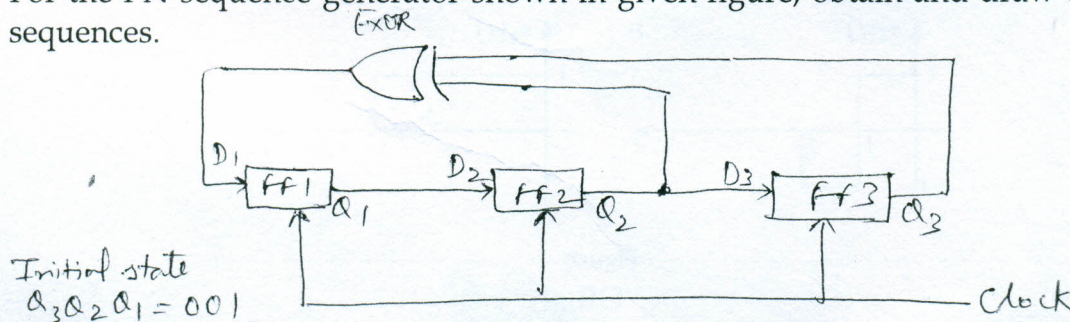
Max. Marks: 100

1. Do not write anything other than your roll number on question paper.
2. Assume suitable data wherever required and mention it clearly.
3. Writing appropriate units, nomenclature, and drawing neat sketches/schematics/ flow chart wherever, required are an integral part of the answer.
4. Use of Non-Programmable calculator is allowed.

- i. What do you understand with OFDM ?
- ii. The process in which the information in a binary PCM is encoded in terms of signal transitions is referred to as..... .
- iii. Express the BPSK signal mathematically.
- iv. Write the full form of GPS.
- v. Why do we use **close all** command in MATLAB?
- vi. What are the different windows in MATLAB?
- vii. The method in which the step size is adapted to the level of the input signal is called..... .
- viii. The and are the two noise effects in Delta modulation.
- ix. In a ASK system information is transmitted via change of carrier signal.
- x. What do you understand with Nyquist rate?

Q.2	Each Question is of 2.5 marks	10
i.	How can we reduce the slope overload error? Explain.	
ii.	Write a MATLAB program to generate triangular wave of frequency 45 kHz.	
iii.	Write a short note on Ranging using DSSS.	
iv.	Explain the generation of ASK.	

Q.3A For the PN sequence generator shown in given figure, obtain and draw the PN sequences. 05





Q.3B Explain the DSSS with a suitable example. 05

Q.4A A Television signal having a BW of 4.2 MHz is transmitted using binary PCM System. Given that the number of Quantization Level is 512. Determine: 05

- I. Final Bit Rate
- II. Output SNR

Q.4B Explain the BFSK detection with suitable diagrams. 05

OR

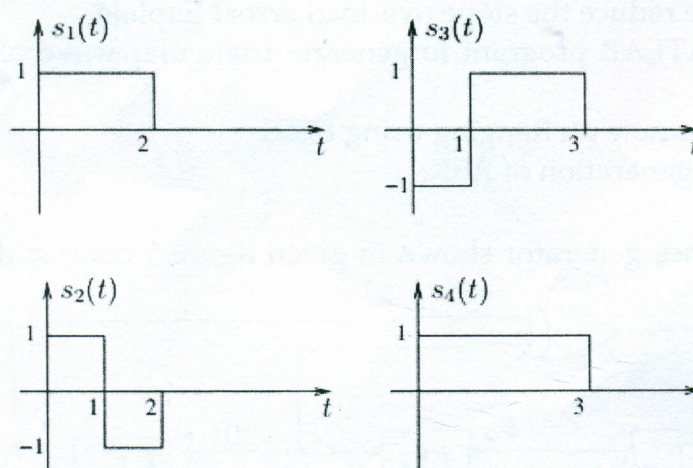
Q.4B Assume that you are required to transmit $F_b = 90$ Mbps data in an authorized bandwidth of 20 MHz. Which modulation technique would you consider and Why? 05

Q.5 Consider a Binary sequence 1 0 1 0 0 1 1 1 0 0 1 0. Draw the waveform for this sequence using the following signaling formats: 10

- I. Polar RZ
- II. Polar NRZ
- III. AMI RZ
- IV. Unipolar NRZ

Q.6 A received signal is either +2V or -2V hold for a time. The signal is corrupted by AWGN noise of power spectral density 10^{-4} watts/Hz. If the signal is processed by an integrator and a dumb receiver, What is the minimum time T during which a signal must be sustained if the probability of error is not exceed 10^{-4} ? 10

Q.7 A signal space consists of four signals $s_1(t)$, $s_2(t)$, $s_3(t)$ and $s_4(t)$ shown in figure. Use the Gram- Schmidt orthogonalization procedure to find an orthogonal basis for the set of signals 10



Figure

OR

Q.7 A recorded conversation is to be transmitted by a pseudo noise spread spectrum system. Assume that the spectrum of the speech waveform is bandlimited to 3 KHz and uses 128 quantization levels. (a) Find out the chip rate required to obtain a processing gain of 20 dB. (b) Given that the sequence length is to be 10

greater than 5 hours. Find out the number of shift register stages required.

Q.8A Explain slow frequency and fast frequency Hopping. 05

Q.8B For a Match Filter receiver, calculate the maximum signal to noise ratio. Assume that the input signal is rectangular pulses of amplitude A and duration T. 10

OR

Q.8B Calculate the probability of error for ASK. 10

Q.9 For an Integrate and Dumb Filter receiver, calculate the maximum signal to noise ratio. Assume that the input signal is rectangular pulses of amplitude A and duration T. 15

