

III B. Tech I Semester Supplementary Examinations, May - 2019**DIGITAL COMMUNICATIONS**

(Electronics and Communication Engineering)

Time: 3 hours

Max. Marks: 70

- Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **FOUR** Questions from **Part-B**
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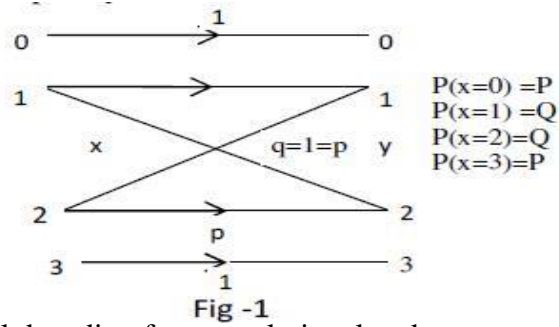
PART -A

1. a) Discuss about the different noise effects in Delta Modulation. [2M]
- b) Explain the non-coherent detection of binary FSK signals. [2M]
- c) Compare a correlator and matched filter. [2M]
- d) Calculate the amount of information if binary digits occur with equal likelihood in binary PCM systems. [3M]
- e) What is discrete memory less channels? [3M]
- f) Explain about BCH codes. [2M]

PART -B

2. a) Explain quantization error and derive an expression for maximum SNR in PCM system that uses linear quantization. [7M]
- b) In a binary PCM system, the output signal to quantizing noise ratio is to be held to a minimum value of 40dB. Determine the number of levels and find the corresponding signal to quantizing noise ratio. [7M]
3. a) Explain how integrator is used to detect the baseband signal. Obtain an expression for S/N of integrator and dump receiver. [7M]
- b) Obtain the probability of error for Matched filter. [7M]
4. a) Draw and explain the coherent system of signal reception. [7M]
- b) Binary data is transmitted over a telephone line with usable bandwidth of 2400 Hz using the FSK signaling scheme. The transmit frequencies are 2025 and 2225 Hz, and the data rate is 300 bits/Sec. The average signal to noise power ratio at the output of the channel is 6dB. Calculate Probability of error for the coherent and non coherent demodulation schemes. [7M]
5. a) Explain the concept of entropy and its properties. [7M]
- b) An analog signal band limited to 10kHz is quantized in 8 levels of a PCM system with probabilities of 1/4, 1/5, 1/5, 1/10, 1/10, 1/20, 1/20 and 1/20 respectively. Calculate the entropy and the rate of information. [7M]

6. a) Discuss in brief about continuous channel capacity. [7M]
 b) Calculate the capacity of the discrete channel shown in Fig.1. Assume $r_s=1$ symbol/sec, [7M]



7. a) Explain sequential decoding for convolutional codes. [7M]
 b) Draw the state diagram, tree diagram, and trellis diagram for $k=3$, rate $1/3$ code generated by $g_1(x) = 1+x^2$, $g_2(x) = 1+x$ and $g_3(x) = 1+x+x^2$. [7M]
