Total No. of Questions : 8]

SEAT No. : ____

PF-4735

[Total No. of Pages : 3

[6625]-28

S.E. (Electronics/E&TC/E.C.E/E.E.(VLSI D&T))

PRINCIPLES OF COMMUNICATION SYSTEMS

(2019 Pattern) (Semester - IV) (204193)

Time : 2½ Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 and Q.7 or Q.8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

Q1) a) Explain Armstrong's indirect method of FM generation. **[6]**

b) FM wave is represented by the following equation, **[6]**

$V = 10 \sin [5 \times 10^8 t + 3 \sin 10^4 t]$

Calculate :

i) Carrier and modulating frequency

ii) Modulation index and maxium deviation

iii) Power dissipated by FM wave in 100 Ω resistor.

c) Draw the circuit diagram of pre-emphasis and de-emphasis and explain it in detail. **[6]**

OR

Q2) a) Draw and explain Balanced slope detector in FM. **[6]**

b) A carrier is frequency modulated with a sinusoidal signal of 15 V peak and frequency of 3kHz. Frequency deviation constant is 1kHz/volt. Calculate the peak frequency deviation, Modulation index and transmission bandwidth. **[6]**

c) Differentiate between NBFM and WBFM. **[6]**

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Q3) a) With suitable example, explain band limited and time limited signal. **[5]**

b) The signal g(t)=10cos(40πt) cos(400πt) is sampled at the rate of 500 samples/sec. **[6]**

i) Determine the Nyquist rate.

ii) Calculate the cut off frequency of ideal reconstruction filter.

iii) Draw the spectrum of resulting sampled signal.

c) Compare PAM, PWM and PPM with waveform. **[6]**

OR

Q4) a) What is the need of analog to digital conversion and give advantages of digital signal over analog signal. **[5]**

b) ExplainTDM System with block diagram and necessary waveforms. **[6]**

c) State sampling theorem and discuss its types. **[6]**

Q5) a) What do you mean by uniform and non-uniform quantization? Explain two types of uniform quantization. **[6]**

b) A sinusoidal signal with cut-off frequency of 4 kHz is digitized into 8 bit PCM sampled at Nyquist rate. Calculate bit rate, Transmission bandwidth and SNR of PCM. **[6]**

c) Compare PCM, DM, DPCM and ADM. **[6]**

OR

Q6) a) With the help of a block diagram explain transmitter and receiver of PCM. **[6]**

b) Explain the two distortions which occur in Delta modulation. **[6]**

c) Explain A-law and μ law Companding. **[6]**

Q7) a) Draw and explain AT & T hierarchy of multiplexing. **[5]**

b) Represent the data 11010010 in following data formats : **[6]**

i) Unipolar RZ

ii) Polar RZ

iii) AMI

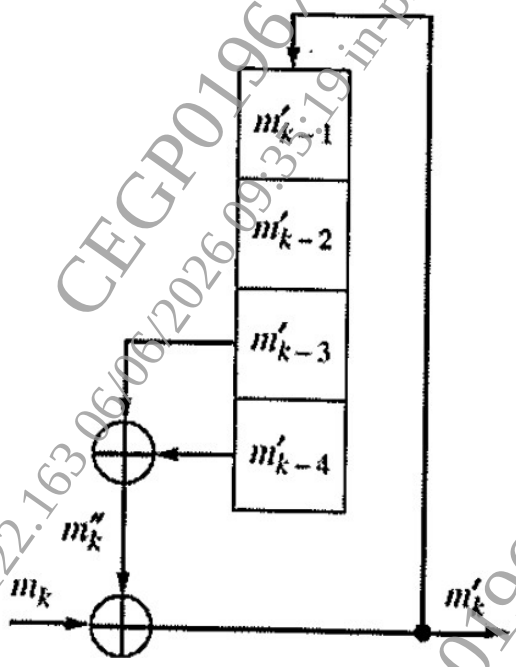
iv) Manchester

c) What is Inter Symbol Interference (ISI)? Explain causes of ISI and solutions to minimize it. **[6]**

OR

Q8) a) What do you understand by Line code? Write properties of line codes. **[5]**

b) A scrambler is shown in fig. Design the corresponding unscramble. If a sequence 10110000000001 is applied to the input determine the output also. **[6]**



c) What do you understand by synchronization Explain the bit synchronization in detail? **[6]**

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