Total No. of Questions : 8]

SEAT No. :

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[Total No. of Pages : 2

[6261]-23

S.E. (E & TC/Electronics & Computer Engineering)

PRINCIPLES OF COMMUNICATION SYSTEMS

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

Time : 2½ Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Assume Suitable data if necessary.***

Q1) a) Draw & Explain Armstrong method of FM generation. **[6]**

b) State significance of pre-emphasis and de-emphasis in FM. **[6]**

c) FM wave is represented by following equation **[6]**

V(E) = 12Cos [$6 \times 10^8 t$ + 5sin 1250t] calculate

i) Carrier frequency

ii) Modulating frequency

iii) Modulation index

iv) Maximum Deviation

v) Power dissipated by FM wave in 1052 resister

OR

Q2) a) Explain FM detection using PLL. **[6]**

b) Draw and explain block diagram of super heterodyne FM receiver. **[6]**

c) The maximum deviation allowed in FM broadcast system is 75kHz. It modulating signal is single tone sinusoid of 8kHz, determine the bandwith of FM signal. What will be the bandwidth when modulating signal frequency is doubled. **[6]**

P.T.O.

Q3) a) Explain types of sampling with waveform. **[6]**

b) Explain with block diagram and waveform, generation of PAM. **[6]**

c) What is aliasing? How to reduce it. **[5]**

OR

Q4) a) Compare PAM, PWM and PPM with waveform. **[6]**

b) Explain need of time division multiplexing? Why synchronization is needed in TDM system. **[6]**

c) Find the Nyquist rate and Nyquist interval for following signal, **[5]**

$X(t) = 3\cos(200\pi t) + 5\sin(600\pi t) + 10\cos(1200\pi t)$

Q5) a) Draw and explain block diagram of Delta Modulation. **[6]**

b) Explain need of digital communication. **[6]**

c) Explain types of quantization with neat waveform. **[6]**

OR

Q6) a) Draw and explain block diagram of PCM transmitter. **[6]**

b) Differentiate between A law compander and μ law compander. **[6]**

c) A television signal with bandwidth of 4.2MHz is transmitted using binary PCM. The number of quantization levels is 512 calculate **[6]**

i) signalling rate

ii) transmission band width

Q7) a) Explain various data formats. **[6]**

b) What is inter symbol interference (ISI)? Explain methods to eliminate it. **[6]**

c) Explain need of synchronizer in digital multiplexing. Explain frame synchronization. **[5]**

OR

Q8) a) Explain working principle of scrambling and unscrambling with example. **[6]**

b) Draw and explain AT & T hierarchy multiplexing system. **[6]**

c) What is equalizer? Explain Adaptive equalizer. **[5]**