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S.E. (Electronics / E & TC / Electronics & Computer) PRINCIPLES OF COMMUNICATION SYSTEMS (Semester - IV) (2019 Pattern) (204193)

Time : 2¹/₂ Hours] Instructions to the candidates : [Max. Marks : 70

1) Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q.8.

- Neat diagrams must be drawn whenever necessary.
- 3) Assume suitable data, if necessary.

Q1) a) Define modulation index & Deviation ratio of FM & sketch FM waveform [6]

- b) Compare frequency modulation with phase modulation. [6]
- c) FM wave is represented by following eqⁿ $V = 20 \sin [10^8 t + 4 \sin 1200t]$ calculate, [6]
 - i) Carrier frequency
 - ii) Modulating frequency
 - iii) Modulation index & maximum deviation
 - iv) Power dissipated by FM wave in 8Ω resistor.

OR

- (Q2) a) Explain FM generation by Armstrong method with near block diagram.[6]
 - b) A carrier is frequency modulated with Sinusoidal signal of 2kHz resulting in frequency deviation of 6kHz [6]
 - i) Find BW & modulation index of modulated wave
 - ii) If amplitude of modulating Sinusoidal signal is increased by 2 & its frequency is halved, find maximum frequency deviation & bandwidth of new modulated signal.
 - c) Explain pre-emphasis in FM with circuit diagram & frequency response.

[6]

P.T.O.

- Q3) a) State sampling theorem in time domain. Explain sampling process with block diagram. [6]
 - b) Describe generation of pulse width modulation with diagram and waveform. [6]
 - c) Explain Aliasing effect & draw the sampled output for sampling frequency less than equal to and greater than maximum frequency of analog signal.[5]

OR

- Q4) a) Compare pulse Amplitude modulation and pulse position modulation.[6]
 - b) Define Time Division multiplexing. Explain concept of TDM with neat diagram. [6]
 - c) Describe detection of PPM with block diagram. [5]
- Q5) a)Draw block diagram of PCM system & Describe working of PCM
transmitter.[6]
 - b) State types of quantization. Explain uniform quantization with neat waveform. [6]
 - c) Discuss with neat schematic, transmitter and receiver for DPCM (Differential pulse code modulation). [6]

Q6) a) Compare Analog and Digital communication.

- b) Draw Block diagram of Delta modulation system & comment on drawback of Delta Modulation [6]
- c) Explain working of Adaptive Delta Modulation with block diagram & state advantages of ADM over DM. [6]

(Q7) a) Draw the following data formats for bit stream 10110100101 [6]

iv)

Polar NRZ

- i) Unipolar RZ ii) Unipolar NRZ
- iii) Polar RZ
- v) AMI (Alternative mark Inversion)
- vi) Split Phase Manchester

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- b) State different Synchronization technique & explain any one in detail with neat diagram. [6]
- c) Define Equalizer. Explain Adaptive equalization with block diagram & State Advantages of Adaptive equalization. [5]

OR

- (Q8) a) Explain the working principle of scrambling & unscrambling with example. [6]
 - b) Describe eve pattern Graphical Display of Inter Symbol Interference with diagram. [6]
 - c) Describe concept of digital multiplexer and Demultiplexer with necessary diagram. [5]