Total No. of Questions : 8]

SEAT No. : ____

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

PRINCIPLES OF COMMUNICATION SYSTEMS

(Semester - IV) (2019 Pattern) (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, Q.7 or Q.8.***
2) ***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 for sinusoidal input. **[6]**

b) Compare frequency modulation with phase modulation. **[6]**

c) FM wave is represented by following eq^{n} 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 neat 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]**

OR

Q6) a) Compare Analog and Digital communication. **[6]**

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]**

i) Unipolar RZ

ii) Unipolar NRZ

iii) Polar RZ

iv) Polar NRZ

v) AMI (Alternative mark Inversion)

vi) Split Phase Manchester

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 eye pattern Graphical Display of Inter Symbol Interference with diagram. **[6]**

c) Describe concept of digital multiplexer and Demultiplexer with necessary diagram. **[5]**

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