Total No. of Questions : 8]

SEAT No. : ____

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

PRINCIPLES OF COMMUNICATION (2019 Pattern) (Semester - IV) (204193)

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

Instructions to the candidates :

1) ***Attempt Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7or Q8.***
2) ***Assume suitable data, if necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Neat diagrams must be drawn wherever necessary.***

Q1) a) Classify FM generazation methods & with suitable diagram explain FM generation by Armstrong's Indirect method. **[6]**

b) A frequency modulated signal is represented by voltage equation $e_{FM}=10\sin[6\times10^{8}t+5\sin1250t]$ calculate **[6]**

i) Carrier frequency f_c ii) Modulating frequency$_{(FM)}$

iii) Max^{m} deviation δ

iv) What power will this FM wave dissipates in 20Ω resistor?

c) Give comparison between pre-emphasis & De-emphasis in FM. **[6]**

OR

Q2) a) State the types of FM detector & with neat diagram explain Balanced slope detector. **[6]**

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

c) Sketch PM waveform for sinusoidal input signal. Enlist advantages & disadvantages of phase modulation. **[6]**

Q3) a) Describe Band limited & time limited signal with suitable example. **[6]**

b) Draw & explain spectrum showing aliasing effect & Guard band. **[6]**

c) Consider the signal {3cos(200πt)+(5sin 6000πt)+10 cos 1200πt} what is Nyquist rate for this signal? **[5]**

OR

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Q4) a) Describe with the help of neat sketches of wave forms methods of generation of PWM. **[6]**

b) Illustrate the classification of multiplexing & with suitable diagram explain time division multiplexing. **[6]**

c) The signal g(t)=10 cos (40πt) cos (400πt) is sampled at a rate of 500 samples/sec. **[5]**

i) Determine the Nyquist rate

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

iii) Draw the spectrum of resulting sampled signal.

Q5) a) Draw block diagram of Digital communication system & explain function of each block. **[6]**

b) State types of quantization & explain uniform quantization in detail with characteristics. **[6]**

c) Compare A-law & μ-law compander. **[6]**

OR

Q6) a) Draw & explain Delta modulation waveform with slope overload & granular noise. **[6]**

b) With neat block diagram explain PCM transmitter. **[6]**

c) Describe Adaptive Delta modulation with neat diagram. **[6]**

Q7) a) Define synchronization & with block diagram explain bit synchronization. **[6]**

b) Explain the properties of line codes. **[5]**

c) Draw AT&T hierarchy multiplexing system & explain it in detail. **[6]**

OR

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

b) Describe with block diagram ditital signal hierarchy using T_1 carrier system. **[6]**

c) Draw the line codes - unipolar Rz, polar Rz, AMI & split phase manchester for the bit stream 10110010. **[5]**

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