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GIET MAIN CAMPUS AUTONOMOUS GUNUPUR – 765022

B. Tech Degree Examinations, December – 2020

(Fifth Semester)

BEIPC5010 – Communication System Engineering

(Applied Electronics & Instrumentation Engineering)

Time: 2hrs Maximum; 50 Marks

The figures in the right hand margin indicate marks.

PART – A: (Multiple Choice Questions) (1 x 10= 10 Marks)

Q.1. Answer *ALL* questions

a. Which type/s of Fourier Series allow/s to represent the negative frequencies by plotting the double-sided spectrum for the analysis of periodic signals?
(i) Trigonometric Fourier Series (ii) Polar Fourier Series
(iii) Exponential Fourier Series (iv) All of the above

b. The collection of sinusoidal frequencies present in a modulated carrier is called its
(i)frequency-domain representation (ii) Fourier series
(iii) spectrum (iv) all of the above

c. A signal is a power signal when the signal has
(i)finite average power (ii) infinite average power
(iii)zero average power (iv) none of these

d. The frequency deviation at the output of a phase modulator is maximum at
(i) the zero crossing of the modulating signal (ii) the zero crossing of the modulated signal
(iii) phase reversal (iv) modulating signal phase

e. The phenomenon of strong FM signal dominating a weaker signal on a common frequency is called as
(i) capture effect (ii) clipping
(iii) aliasing (iv) none of these

f. To obtain the same S/N ratio at the same distance from the transmitter, FM transmitter has to transmit_____power as compared to AM.
(i)less (ii) equal
(iii)more (iv)zero

g. Drawback of using PAM method is
(i) Bandwidth is very large as compared to modulating signal (ii) Varying amplitude of carrier varies the peak power required for transmission
(iii) Due to varying amplitude of carrier, it is difficult to remove noise at receiver (iv) All of the above

h. Pulse time modulation (PTM) includes
(i) Pulse width modulation (ii) Pulse position modulation
(iii) Pulse amplitude modulation (iv)Both a and b

i. The bandwidth required for the transmission of a PCM signal increases by a factor of _____ when the number of quantization levels is increased from 4 to 64.
(i) 3 times (ii) 16 times
(iii) 2 times (iv) 4 times

j. If the number bits per sample in a PCM system is increased from and n to (n+1), the improvement is signal to quantization nose ratio will be
(i) 3 dB (ii)6 dB
(iii)2n dB (iv)n dB

PART – B: (Short Answer Questions) (2 x 5 = 10 Marks)

Q.2. Answer ***ALL*** questions

a. What is the difference between time domain representation and frequency domain representation of signals?

b. For a carrier signal of 1 MHz and modulating signal of 2 kHz what is the frequency range occupied by the AM signal?

c. Mention any two disadvantages of FM.

d. Define Figure of merit.

e. What are the applications of PCM?

PART – C: (Long Answer Questions) (6 x 5 =30 Marks)

Answer ***ANY FIVE*** questions Marks

3. A message signal $m(t) = \cos 2000\pi t + 2\cos 4000\pi t$, modulates the carrier $c(t)=100\cos 2\pi f_c t$ where $f_c=1MHz$ to produce the DSB signal $m(t)c(t)$. (6)

   1. Determine the expression for the upper sideband (USB) signal.

   2. Determine and sketch the spectrum of the USB signal.

4. Explain any one method of generating AM. (6)

5. Discuss about the transmission bandwidth of FM and also state Carson's rule. (6)

6. Find the carrier and modulating frequency, if the modulation index and the maximum deviation of the FM are represented by the equation $V = 12\sin(6x10^8t+5\sin 1250t)$. What power will this FM wave dissipate in a 10Ω resistor? (6)

7. Describe in detail about different types of RF mixers. Draw the basic symbol of RF mixer circuit. (6)

8. Describe how Signal recovery can be done from PAM signal. (6)

9. Explain the properties, characteristics of line coding and also describe how the PCM waveforms are classified. (6)

10. What is the need of equalizers and Write a brief note on adaptive equalization. (6)

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