# COMMUNICATION SYSTEMS

Q.1. Give the mathematical form of sampling process.

Q.2. List out uses of sampling theorem

Q.3. Define instantaneous sampling

Q.4. What is anti alising effect

Q.5. List out the types of Quantization

Q.6. Define bandwidth.

Q.7. What is noise consideration in PCM

Q.8. Define processing gain.

Q.9. What are the three basic units of a communication system?

Q.10. Identify the parts X and Y in the following block diagram of a generalised communication system?

$$X \rightarrow \boxed{\text{Transmitter}} \rightarrow Y \rightarrow \boxed{\text{Receiver}}$$
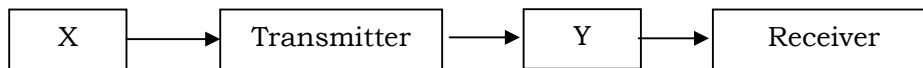
Q.11. What type ofmodulation is requiredfor televiosion broad cast?

Q.12. Why frequency modulation is prefered over amplitude modulation?

Q.13. Why short waves band are used for long distance broadcast?

Q.14. Name the type of radio wave propagation involved when TV signals broadcast by a tallantena are intercepted directly by the receiver antena.

Q.15. What is the purpose of modulating signal in transmission?

Q.16. A modulating signal is a square wave as shown in figure.
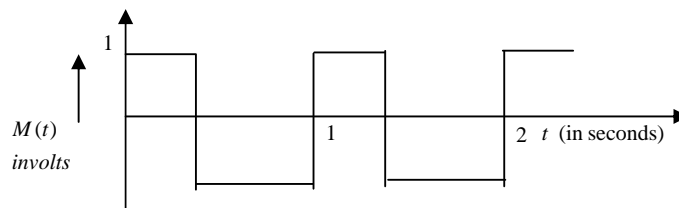
c (t) = 2 sin (8πt) volts

$$f_c = \frac{\omega}{2\pi} = \frac{8\pi}{2\pi} = 4$$

    (i)   Sketch the amplitude modulated waveform.

    (ii)   What is the modulation index?

Q.17. Distinguish between point to point and broadcast communication modes with example.

Q.18. What should be the length of dipole antena for a carrier wave of frequency 600Mhz ?

Q.19. A message has a band width of 5 MHz.Suggest a possible communication channelfor its transmission.

Q.20.A Transmitting antenna at the top of the tower has height of 36m and the height of the receiving antenna is 49 m. What is the maximum distance between them for satisfactory communication in LOPS mode?

Q.21. A Carrier wave of peak voltage 20 V is used totransmit amessage signal. What should be the peak voltage of the modulatig signal in order to have a modulation indexof 80%?

Q.22.Differentiate between analog and digital signals.

Q.23.By what percentage will the transmission rangof a T V tower be affected when the height of the tower is increased by 21 %.

Q.24. What is the type of communication in which signal is discrete and binary coded?

Q.25. Name the type of communication systems according to mode of the transmission.

Q.26. What is amplitude modulation.Show graphically. Write its two limitations and two advantages.

Q.27. Draw block diagram of a simple amplitude modulation, explainingbriefly , how amplitude is achieved.

Q.28. What does the process of dectection of amplitude modulated mean . Explain the function of detecterwith suitable block diagram.

Q.29.What would be the modulation index for an amplitude modulatedwave for which the maximum amplitude is a and minimum amplitude is b.

Q.30. Draw a plot of variation of amplitude versus w for an amplitude modulated wave. Define modulation index. State its importace for effective amplitude modulation.

Q.31. Define the term modulation. Explain the need of modulation. Name three different types of modulationused for message signal usinng carrier wave. Explain the meaning of any one of them.

Q.32. Draw the basic block diagram of analog communication system & explain the function of each block.

Q.33. (a) Draw and explain block diagram of a digital communication system.

(b) Explain different types of multiplexing schemes with suitable diagram.

Q.34. (a) Find trigonometric Fouries series representation of output of half wave rectified sine wave.

(b)Find Fourier transform of signal defined as

$$x(t) = \begin{cases} cos(\alpha t), & -\dfrac{T}{2} < t < \dfrac{T}{2} \\ 0, & otherwise \end{cases}$$

Q.35. Find exponential Fourier series expansion of periodic signal shown in fig. below:
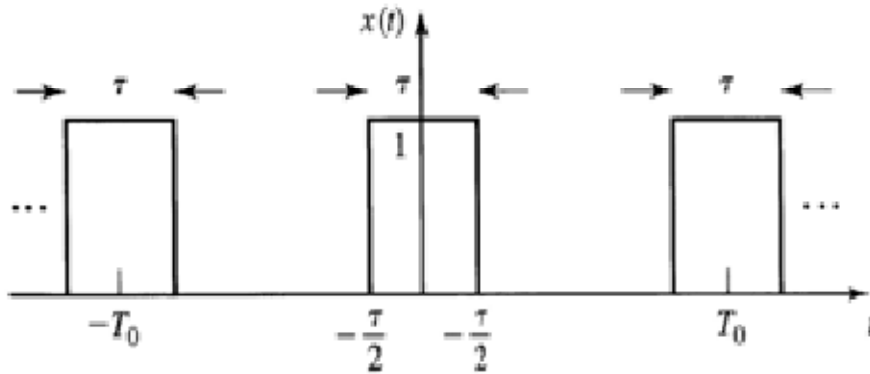
Q.36. Enlist the properties of Fourier transform and prove any three of them.

Q.37. Explain the generation of PPM and PWM with neat circuit diagram.

Q.38. Explain the quantization process with PCM block diagram.

Q.39. Write brief notes on 1) TDM2) FDM

Q.40. Derive mathematical expression for single tone AM& hence show the frequency components present in conventional AM, SSB & DSBSC. Also compare & contrast the three in terms of power and bandwidth.

Q.41. Derive an expression for generation of AM signal using a non-linear device& show how it is realized in square law diode modulator.

Q.42. Explain DSBSC generation using balanced modulator with suitable mathematical expression.

Q.43. Explain design of sideband filter for generation of Vestigial Sideband (VSB)

modulation with suitable mathematical expressions and diagrams.

Q.44. Explain the concept of coherent detection in DSB-SC & SSB-SC with suitable

mathematical expressions and diagrams.

Q.45. Compare frequency and phase modulation and discuss difference between NBFM and

WBFM.

Q.46. Describe Foster-seelay or ratio detector &discuss their advantages and methods to

overcome their limitations.

  Q.47. Compare PAM and PTM &explain different types of PTM.

Q.48. Explain different elements of a PCM system and find an expression for quantization

noise in PCM.

Q.49. Explain DPCM or Delta modulation.

Q.50. Define FSK

Q.51. Draw the Basic block diagram of FSK

Q.52. Define MFSK

Q.53. Draw the wave form of the MPSK

Q.54. What is MSK

Q.55. Define Non-coherent FSK

Q.56. Differentiate coherent FSK from Non-coherent FSK

Q.57.What do you mean by Probability error.

Q.58. Define Passband transmission.

Q.59. Draw the baseband signal.

Q.60. Derive the expression for the BPSK technique.

Q.61. Compare all types of Passband transmission.

Q.62. Discuss the concept of digital modulation techniques and hence explain ASK, FSK, PSK (viz. BPSK, QPSK & M-ary PSK)along-with waveforms and constellation diagrams.

Q.63.Discuss various sources and types of noise along-with their effect on different

frequencies.

 Q.64. Explain (i) SNR (ii) Noise Figure (iii) Noise temperature (iv)Thermal Noise

Q.65.In digital communication, PCM (Pulse Code Modulation) is preferred than PAM (Pulse

Amplitude Modulation). Justify your comment.

Q.64.In sending a binary data over an analog transmission line, what kind of device does

the conversion?

Q.65.For what kind of signal would you use for encoding and decoding process?

Q.66.When a teacher lectures in the class, is the classroom a full duplex communication

system or a half duplex communication system?

Q.67. Your wireless notebook computer works on one desk, but when you move it to a

nearby desk, you cannot receive a signal. What may be happening? How night you fix

the problem?

Q.68.In normal radio operation how does channel bandwidth usually related to bandwidth

required to transmit a data stream of a given speed.

Q.69. In TV transmission which is used –either A.M or F.M?

Q.69. In demodulation stage , how the RF signal is removed from AF?

Q.70. Why is delta modulation a convenient method of digital modulation.

Q.71. What is necessary for full duplex operation using a two wire circuit? Give an example of full-duplex transmission.

Q.72. What is necessary for full duplex operation using a two wire circuit? Give an example of full-duplex transmission.

Q.73. If you want transmit an audio signal for long distance , How it can be made possible?

Q.74. Draw the wave form for (i) PAM and (II) PPM . Explain

Q.75.An AM wave is represented by Cm(t) = 6 (1+0.5cos 12560t) cos 22x105 t. Calculate: Amplitude and frequency of carrier, Modulation Index , Maximum and Minimum amplitude of the AM wave.

Q.76. An FM transmission has a frequency deviation of 18.75 kHz. Find percentage modulation, if it is broadcast

Q.77.An FM signal has a resting frequency of 100MHz and the highest frequency of 100.05MHz when modulated by an audio signal of 5kHz.Determine

i) Frequency deviation

ii) Carrier swing

iii) Modulation index

iv) Percent modulation

Q.78. Write short note on Hilbert Transform.

Q.79. Explain with block diagram the Armstrong method of FM generation.

Q.80. Explain narrowband and wideband FM with block diagrams.

Q.81. Explain the FM threshold effect and capture effect.

Q.82. Classify various types of signals encountered in communication systems.

Q.83. What is the need of modulation? Elaborate.

Q.84. State and explain Shannon's theorems on channel capacity.

Q.85. Explain the generation of SSB using Weaver's method.

Q.86. Write a note on VSB modulation system.

Q.87. Explain digital communication system in general.

Q.88. Explain generation of SSB using balanced modulator method.

Q.89. Differentiate between information and signal.

Q.90. Explain quantization.

Q.91. What is remedy to reduce ISI?

Q.92. What is Nyquist's criteria for distortionless transmission? Explain.

Q.93. What are the types of digital modulation techniques? Explain.

Q.94. Explain the principle of DPSK.

Q.95. Explain SNR.

Q.96. What is noise? How does it affects performance of communication systems? Discuss some common types of noise occurring in communication systems.

Q.97. Differentiate between frequency modulation and phase modulation.

Q.98. Explain various types of linear modulation techniques.

Q.99. Classify various types of systems.

Q.100. Discuss some industrial applications of communication systems used now a days.