B. TECH. DEGREE EXAMINATIONS: APRIL/MAY 2009

Third Semester

INFORMATION TECHNOLOGY

U07IT301 Principles of Communication

Time: Three Hours   Maximum Marks: 100

Answer ALL the Questions:-

PART A (20 x 1= 20 Marks)

1. The amplitude modulator works on the principle of _____

    A. Addition   B. Subtraction   C. Multiplication   D. Division

2. A carrier of 100W is modulated to a depth of 50%. The total transmitted power is

    A. 112.5 W   B. 125W   C. 150W   D. 100W

3. A high value of IF in a superheterodyne receiver _____

    A. Improves the sensitivity   B. Degrades the sensitivity   C. Improves IMRR   D. Degrades IMRR

4. A carrier is amplitude modulated simultaneously by two sine waves with modulation indices of 0.3 and 0.6. The effective modulation index is_____

    A. 0.9   B.0 .3   C. 0.67   D. 0.53

5. FM can be generated using PM by _____ .

    A. Passing a modulating signal through a low pass filter
    B. Passing a modulating signal through a high pass filter
    C. Using the pre-emphasis
    D. Using the de-emphasis

6. The transmitted power in an FM system is _____

    A. Dependent on the number of sidebands
    B. Always constant
    C. Dependent on the power of sidebands
    D. Dependent on the carrier power

7. The linearity of the output characteristics is best for _____ .

    A. Balanced slope detector   B. Phase discriminator
    C. PLL demodulator   D. Ratio detector

8. In the FM receivers, the demodulators are primarily used for _____

    A. Suppressing the amplitude variations
    B. Suppressing the frequency variations
    C. Converting phase changes into amplitude changes
    D. Converting frequency changes into amplitude changes

9. Bandwidth of QPSK is _____ as compared to that of BPSK

    A. Thrice   B. Double   C.Same   D. Half

10. MSK is basically _____

    A. QPSK   B. FSK   C. ASK   D. DPSK

11. The bandwidth of ASK signal is _____ if the bit rate is R

    A. R   B. 2R   C. R/2   D. 3R

12. How many phases are transmitted in QPSK?

    A. 2   B. 4   C. 8   D. 16

13. The reconstruction filter used in the ideal sampling process is _____.

    A. an ideal low pass filter   B. an ideal high pass filter
    C. an ideal band pass filter   D. an ideal band reject filter

14. In pulse code modulation(PCM), the information is transmitted in the form
    of_____

    A. Variation in the amplitude of pulses
    B. Variation in the width of pulses
    C. Variation in the position of pulses
    D. Code words each of N bit length

15. Slope overload error in DM is reduced by_____

    A. Reducing the step size   B. reducing the sampling frequency
    C. Increasing the signaling rate   D. Increasing the sampling frequency

16. If the number of quantization levels are 64, then the maximum signal to
    quantization noise ratio with a non sinusoidal input is_____.

    A. 37.8 dB   B. 37dB   C. 40.8 dB   D. 40 dB

17. The spread spectrum signal occupies a _____ bandwidth than that of a
    normal signal.

    A. same   B. larger   C. lesser   D. twice

18. In a spread spectrum communication system, duration of each information bit, T_b = 4.095ms and chip duration of a PN sequence T_c= 1μs. Calculate the processing gain.

A. $244*10^{-6}$ B. $488*10^{-6}$ C. 4095   D. 8190

19. Synchronization is necessary in _____ type of multiple access technique

A. CDMA   B. SDMA   C. FDMA   D. TDMA

20. If 4 FFs are used in a PN sequence generator, the maximum length of the sequence is

_____

A. 4   B. 8   C. 7   D. 15

PART B (5 x 16 = 80 Marks)

21. (a) What are the advantages of super heterodyne receiver over TRF receiver? Draw the block diagram of super heterodyne receiver and explain the function of each block

(OR)

21. (b) (i) Explain the generation of AM signals.   (10)

(ii) An amplitude modulator amplifier has an output of 50W at 100% modulation. The internal loss in the modulator is 10 Watts. Determine (i) unmodulated carrier power (ii) the power output required from the modulator (iii) if the percentage of modulation is reduced tom 75%, how much output is needed from the modulator.
                                                                                                      (6)

22. (a) (i) With neat block diagram explain the Armstrong method of generating FM signal
                                                                                                      (8)
(ii) Explain an expression for a single tone FM signal and draw its spectrum.   (8)

(OR)

22. (b) (i) Explain any two techniques of demodulation of FM   (10)

(ii) Explain how varactor diode can be used for frequency modulation   (6)

23. (a) Explain the operation of QPSK Transmitter and Receiver

(OR)

(b) Explain about the generation and detection of DPSK signal and given a binary data sequence 0 0 1 0 0 1 0 0 1 1 assuming starting reference as one.

24. (a) (i) Explain various binary data formats with an example (8)

(ii) Write short notes about DPCM transmitter and receiver (8)

(OR)

24. (b) (i) Explain in detail about Intersymbol interference and pulse shaping (12)

(ii) List out the information provided by eye pattern about the system performance (4)

25. (a) (i) Draw the functional block diagram of a direct sequence spread spectrum modulator and demodulator and explain (12)

(ii) List out the application of spread spectrum technique (4)

(OR)

25. (b) (i) Derive the expression for processing gain in spread spectrum system (12)

(ii) Compare slow and fast frequency hopping techniques (4)

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