End Semester Exam KT

TE (Semester-VII)

Discrete Time Signal Processing

1. What is the region between stop band and the pass band frequencies in the magnitude frequency response of a low pass filter? (1 mks)

a) Stop band

b) Pass band

c) Transition band

d) Round Band

2. If δ_P is the forbidden magnitude value in the pass band and δ_S is the forbidden magnitude value in the stop band, then which of the following is true in the pass band region? (2 mks)

a) $1-\delta_S \leq |H(j\Omega)| \leq 1$

b) $\delta_P \leq |H(j\Omega)| \leq 1$

c) $0 \leq |H(j\Omega)| \leq \delta_S$

d) $1-\delta_P \leq |H(j\Omega)| \leq 1$

3. Value for Twiddle factor W_8^0 is : (1 mks)
   a. 1
   b. -1
   c. -j
   d. J

4. If x(n) is real sequence, then find the missing term of X(K) ={ 6, _____, -2, 4-2j} (2 mks)
   a. -2j
   b. 6
   c. 4+2j
   d. 12

5. Find DFT of x(n)={1,1,1,1) (2 mks)
   a. X(K)={0,0,0,0}
   b. X(K)={5,0,0,0}
   c. X(K)={26,-2+2j,-2,-2-2j}
   d. X(K)={10,-2+2j,-2,-2-2j}

6. .DFT of x(n)={a,b,c,d} is X(K)={A,B,C,D} then DFT of x{a,0,0,b,0,0,c,0,0,d,0,0} is (2 mks)
   a. X(K)={ A,B,C,D,A,B,C,D,A,B,C,D}
   b. X(K)={ 0,0,0,0,A,B,C,D,A,B,C,D}
   c. X(K)={ A,B,C,D,A,B,C,D}
   d. X(K)={ A,B,C,D,0,0,0,0,0,0,0,0}

7. In Overlap save method of long sequence filtering, how many zeros are appended to the impulse response of the FIR filter , If L is the length of input sequence ? (1 mks)

   a) L/2

   b) L

   c) L+1

   d) L-1

8. What is the full form of DIT -DFT? (1 mks)
   a. Decimation in Time -Discrete Fourier Transform
   b. Disctrete in Time -Discrete Fourier Transform
   c. Decimation in Time -Decimation Fourier Transform
   d. Discrete in Time -Decimation Fourier Transform

9. How many complex multiplications are need to be performed for each FFT algorithm? (2 mks)

   a) (4N/2)logN

   b) Nlog2N

   c) $\frac{N}{2} log_2 N$

   d)$\frac{N}{8} log_2 N$

10. FFT of x(n)={1,2,3,4) is (2 mks)
    a. X(K)={10,-2+2j,-2,-2-2j}
    b. X(K)={10,20,-2,-2-2j}
    c. X(K)={6,-2,4,-2}

d. X(K)={6,-2+2j,-2,-2-2j}

11. For a decimation-in-time FFT algorithm, which of the following is true? (2 mks)

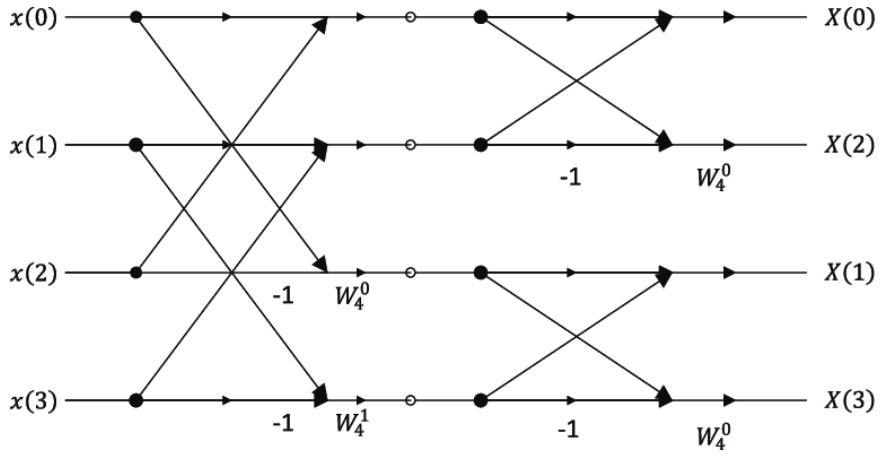
a) Both input and output are in order

b) Both input and output are shuffled

c) Input is shuffled and output is in order

d) Input is in order and output is shuffled

12. The following butterfly diagram is used in the computation of _____(2 mks)



a. Decimation-in-time FFT
b. Decimation-in-frequency FFT
c. DFT
d. FIR

13. Which Filter given below has the frequency response maximally flat in the passband (2 mks)

a. Butterworth

b. Chebyshev type 1

c. Chebyshev type 2

d. Elliptic

14. Normalised Butterworth polynomial of order 1 is given by: (2 mks)

a. $\frac{1}{s+1}$

b. $\frac{1}{s^2+\sqrt{2}s+1}$

c. 1/(s+2)
d. 1/(s+4)

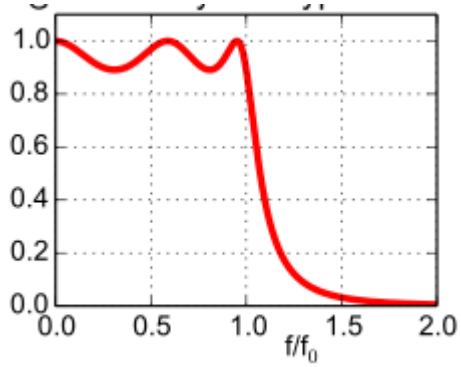
15. Normalised Chebyshev polynomial of order 1 is given by: (2 mks)

a. 1/(s+1)
b. 1/(s^2+√2 s+1)
c. 1/(s+2)
d. 1/(s+4)

16. Which Filter given below has ripples in the Stop band in the frequency response (2 mks)

a. Butterworth
b. Chebyshev type 1
c. Chebyshev type 2
d. Elliptic

17. Identify the filter from the pass band frequency response given below (2 mks)



a. Butterworth

b. Chebyshev type 1

c. Chebyshev type 2

d. Elliptic

18. Full form of IIR filter is given by: (2 mks)

a. Infinite Input Response
b. Infinite Impulse Response
c. Input Infinite Response
d. Impulse Infinite Response

19. Which of the following rule is used in the bilinear transformation? (1 mks)

a) Simpson's rule

b) Backward difference

c) Forward difference

d) Trapezoidal rule

20. Which of the following is not the window technique? (1 mks)

a) Rectangular

b) Triangular

c) Pentagonal

d) Kaiser

21. Which of the following condition should the unit sample response of a FIR filter satisfy to have a linear phase? (2 mks)

a) h(M-1-n) n=0,1,2…M-1

b) ±h(M-1-n) n=0,1,2…M-1

c) -h(M-1-n) n=0,1,2…M-1

d) -h(M-1-n) n=0,-1-,2…-M-1

22. Out of the following window functions which has the smallest transition width? (2 mks)

a. Rectangular

b. Bartlett

c. Hamming

d. Blackman

23. Which of the following windows has a time domain sequence h(n)=$1-\frac{2\left[n-\frac{M-1}{2}\right]}{M-1}$ (2 mks)

a) Bartlett window

b) Blackman window

c) Hanning window

d) Hamming window

24. What is the peak side lobe (in dB) for a rectangular window? (2 mks)

a) -13

b) -27

c) -32

d) -58

25. What is the approximate transition width of main lobe of a Rectangular window? (2 mks)

a) $4\pi/M$

b) $8\pi/M$

c) $12\pi/M$

d) $2\pi/M$

26. Which of the following windows has a time domain sequence $h(n)=12(1-\cos(2\pi n/M-1))$? (2 mks)

a) Bartlett window
b) Blackman window
c) Hamming window
d) Hanning window

27. The _____effect is not caused due to finite word lengths effect: (1 mks)

1) Coefficient quantization error
2) Adder overflow limit cycle
3) Round off noise
4) Inertia

28. What is the process of increasing the sampling rate by a factor I? (1 mks)

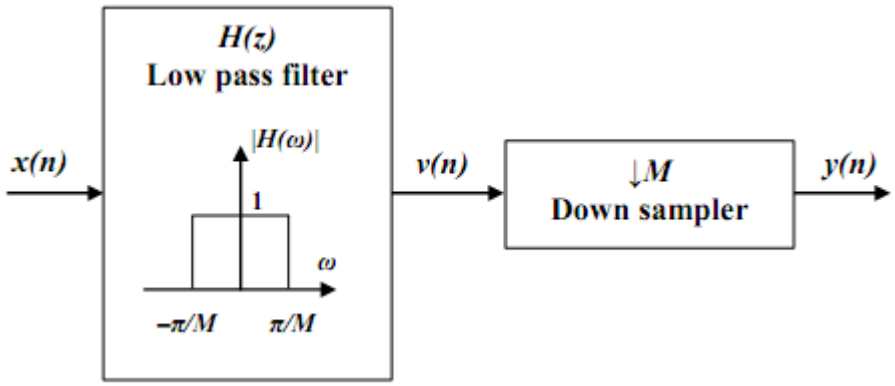
a) Sampling rate conversion

b) Interpolation

c) Decimation

d) Interaction

29. Which process has a block diagram as shown in the figure below?
(2 mks)



a) Sampling rate conversion

b) Interpolation

c) Decimation

d) None of the mentioned

30. The representation of (0.7)10 in the binary using 4 bits where first bit is reserved for sign will be ____ (2 mks)

(0101)2

(1101)2

(0111)2

(0011)2

31. .Full form of DTMF is : (1 mks)

a. Dual Tone Multi Frequency
b. Digital Tone Multi Frequency
c. Dual Timing Multi Frequency
d. Dual Tone Multi Form