Program: BE Electronics and Telecommunication Engineering

Curriculum Scheme: Revised 2012

Examination: Third Year Semester VI

Course Code: **ETC602** and Course Name: **DTSP**

Time: 1 hour Max. Marks: 50

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Note to the students:- All the Questions are compulsory and carry equal marks .

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| Q1.  | Which of the following is a not Dirichlet condition with respect to the signal x(t)? |
| Option A: | x(t) has a finite number of discontinuities in any period |
| Option B: | x(t) has finite number of maxima and minima during any period |
| Option C: | x(t) is causal signal |
| Option D:  | x(t) is absolutely integrable in any period |
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| Q2. | Find the Z-transform of a^n u(n); a<0. |
| Option A: | z/z−a |
| Option B: | z/z+a |
| Option C: | 1/1−az |
| Option D: | 1/1+az |
|  |  |
| Q3. | The computational procedure for Decimation in frequency algorithm takes |
| Option A: | Log2 N stages |
| Option B: | 2Log2 N stages |
| Option C: | Log2 N2 stages |
| Option D: | Log2 N/2 stages |
|  |  |
| Q4. | If x(n) and X(k) are an N-point DFT pair, then X(k+N)=? |
| Option A: | X(-k) |
| Option B: | -X(k) |
| Option C: | X(k) |
| Option D: | X(k-n) |
|  |  |
| Q5. | Calculate DFT of sequence x(n) = (1, 1, -2, -2) |
| Option A: | (8, -2, 0, -2) |
| Option B: | (7, -1+2j, -1, -1-2j) |
| Option C: | (5, 1, 1, 1) |
| Option D:  | (-2, 3-3j, 1, 3+3j) |
|  |  |
| Q6. | Time reversal property of DFT if x(n)→X(k) |
| Option A: | DFT[x(-n+m)] = X(-k) |
| Option B: | DFT[x(-n)] = X(-k) |
| Option C: | DFT[x(n-m)] = X(-k) |
| Option D:  | DFT[x(-n)] = X(k) |
|  |  |
| Q7.  | Symmetry property of twiddle factor is WNk+N/2=? |
| Option A: | WNk |
| Option B: | -WNk |
| Option C: | WN-k |
| Option D:  | WN-k+1 |
|  |  |
| Q8.  | Inverse DITFFT of X(k) = (10, -2+2j, -2, -2-2j) is |
| Option A: | (0, 1, 2, 3) |
| Option B: | (1, -2, 3, -4) |
| Option C: | (1, 2, 3, 4) |
| Option D:  | (1, 1, 2, 2) |
|  |  |
| Q9. | A Chebyshev type II filter has |
| Option A: | Ripples in the stop band |
| Option B: | Poles of H(-s) on the right side and H(s) on the left side of the unit circle |
| Option C: | Ripples in the pass band |
| Option D:  | Ripples in both pass and stop band. |
|  |  |
| Q10.  | Disrete fourier transform convert time domain signal to |
| Option A: | Analog signal |
| Option B: | Digital signal |
| Option C: | Continous signal |
| Option D:  | Frequency domain |
|  |  |
| Q11.  | What is the width of the main lobe of the frequency response of a rectangular window of length M-1? |
| Option A: | π/M |
| Option B: | 2π/M |
| Option C: | 4π/M |
| Option D:  | 8π/M |
|  |  |
| Q12.  | If one of the zeros lie at $0.2 e^{jπ/3}$ then the other zeros will be positioned at |
| Option A: | $$0.2 e^{-jπ/3}$$ |
| Option B: | $$2 e^{jπ/3}$$ |
| Option C: | $$0.2 e^{-jπ/3} 0.2 e^{jπ/3} 2 e^{jπ/3} \& 2 e^{-jπ/3}$$ |
| Option D: | $$0.2 e^{-jπ/3}0.2 e^{-jπ/3}5 e^{jπ/3} \& 5 e^{-jπ/3}$$ |
|  |  |
| Q13. | The frequency response of a digital filter is periodic in the range |
| Option A: | 0 <w < 2π |
| Option B: | -π < w < π |
| Option C: | 0 < w < π |
| Option D:  | 0 <w < 2π or -π < w < π |
|  |  |
| Q14.  | FIR low pass filter with pass band gain of unity and cutoff frequency of 1KHz and a sampling frequency of 5KHz using a rectangular window of length has coefficients:  |
| Option A: |  -0.06236, 0.0935, 0.327,0.4,0.0935,-0.06236 |
| Option B: | -0.0236, 0.035, 0.27,0.14,0.035,-0.0236 |
| Option C: | -0.6236, 0.935, 0.1327,0.24,0.935,-0.6236 |
| Option D:  | -0.0448, 0.0345, 0.327,0.4,0.0345,-0.0448 |
|  |  |
| Q15. | How is the operating level of sampling rate for the sub filters involved in the polyphase filters? |
| Option A: | High |
| Option B: | Moderate |
| Option C: | Low |
| Option D:  | High boost |
|  |  |
| Q16.  | Anti-imaging filter is\_\_\_\_\_\_\_\_ filter |
| Option A: | Low pass |
| Option B: | High pass |
| Option C: | Band pass |
| Option D:  | Notch |
|  |  |
| Q17. | Application of multirate DSP system |
| Option A: | Solar system |
| Option B: | RADAR |
| Option C: | DTMF |
| Option D: | Image compression |
|  |  |
| Q18. | Interpolator is \_\_\_\_\_\_\_\_ |
| Option A: | Periodic system |
| Option B: | Non linear system |
| Option C: | Linear system |
| Option D:  | Non periodic system |
|  |  |
| Q19.  | What is the value of the variance of quantization error in FFT algorithm, compared to that of direct computation? |
| Option A: | Greater |
| Option B: | Equal |
| Option C: | Less |
| Option D:  | Cannot compare |
|  |  |
| Q20. | With n bit binary the possible binary codes are |
| Option A: | 2 n-1 |
| Option B: | 2 n+1  |
| Option C: | 2 n  |
| Option D: | 2 n/2  |
|  |  |
| Q21. | In the frequency response characteristics of FIR filter, the number of bits per coefficient should be \_\_\_\_\_\_\_\_\_in order to maintain the same error. |
| Option A: | Increase |
| Option B: | Constant |
| Option C: | Decrease |
| Option D:  | Medium |
|  |  |
| Q22.  | Process of quantization introduces |
| Option A: | Power |
| Option B: | Noise |
| Option C: | Error |
| Option D:  | Distortion |
|  |  |
| Q23. | DTMF signal detection is carried out using: |
| Option A: | Encoder and decoder |
| Option B: | Modulator |
| Option C: | Synthesizer |
| Option D:  | Sampler |
|  |  |
| Q24.  | One of the major functions of DSP in RADAR is |
| Option A: | Demodulating |
| Option B: | Estimation of Target Position |
| Option C: | ADC |
| Option D:  | DAC |
|  |  |
| Q25. | Which of the following are not a factor for selecting DSP processors |
| Option A: | Processing capability  |
| Option B: | Execution speed |
| Option C: | Word length |
| Option D:  | Type of arithmetic |