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| Scheme | R2016 |
| Semester | VII |
| Course Code | CSC701 |
| Course Name | Digital Signal and Image Processing |

| Question No. | Question | a | b | c | d | Answer Key |
|--------------|--|---|--|---|--|--|
| 1 | Which of the following condition should hold true for a signal $x[n]$ to be odd? | $x[-n] = x[n] \cdot x[n]$ | $x[n] = -x[-n]$ | $x[n] = [x[n]]^3$ | $x[n] = x[n]$ | $x[n] = -x[-n]$ |
| 2 | If the impulse response the system is of infinite duration then it is called | FIR system | IIR system | IIR system | IIF system | IIR system |
| 3 | The overlap save method is used to calculate | convolution between a sampled signal and a finite impulse response (FIR) filter | convolution between a sampled signal and an infinite impulse response (IIR) filter | convolution between a very long signal and a finite impulse response (FIR) filter | convolution between a very long signal and an infinite impulse response (IIR) filter | convolution between a very long signal and a finite impulse |
| 4 | Which of the following property makes it possible to calculate 2D DFT using 1D DFT? | conjugate symmetry | Separability | Time shift | Periodicity | Separability |
| 5 | The 4-point DFT of {1,1,0,0} is | { 2, 1-j, 0, 1+j } | { -2, 1-j, 0, 1+j } | { 4, 1-j, 0, 1+j } | { -2, 1-j, 0, 1-j } | { 2, 1-j, 0, 1+j } |
| 6 | The number of complex addition in direct DFT are | $N(N-1)$ | N^2 | $N\log_2 N$ | $(N/2)\log_2 N$ | $N(N-1)$ |
| 7 | Calculate the minimum sampling rate to avoid aliasing when a continuous time signal is given by $x(t) = 5 \cos 200\pi t$ | 100 Hz | 200 Hz | 250 Hz | 400 Hz | 200 Hz |
| 8 | A random signal is the one | which is discrete in time | which is discrete in value | which varies with respect to only single variable | which can not be represented using an equation or a set of rules | which can not be represented using an equation or a set of rules |
| 9 | The total energy of a discrete time signal is | zero | negative | infinite | finite | finite |

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| 10 | If a discrete time signal $x(n)$ of length l is convolved with a discrete time signal $y(n)$ of length n then the length of output signal is | $l+n-1$ | $l-n+1$ | l^n | l^{n-1} | $l+n-1$ |
| 11 | If sampling frequency is below Nyquist frequency , distortion in the present spectra due to other spectra in the frequency domain is called as _____ | Discrete Fourier Transform | Nyquist – Shannon sampling theory | Aliasing | Up sampling | Aliasing |
| 12 | Auto correlation of $x(n) = [4, 3, 2, 1]$ and its value at lag=0 are | [4, 11, 12, 30, 20, 12,4] and 30 | [4, 11, 20, 30, 20, 12,4] and 30 | [3, 11, 20, 30, 20, 12,3] and 20 | [4, 11, 20, -30, 20, 12,4] and 11 | [4, 11, 20, 30, 20, 12,4] and 30 |
| 13 | DFT of a signal is a lossy process. | No | Yes | May be | No way to decide | No |
| 14 | DFT of a discrete signal is ___ in nature | Continuous | Analog | Discrete | Aperiodic | Discrete |
| 15 | Under which conditions does an initially relaxed system become stable | only if bounded input generates unbounded output | only if bounded input generates bounded output | only if unbounded input generates unbounded output | only if unbounded input generates bounded output | only if bounded input generates bounded output |
| 16 | The N-point DFT of a L-point sequence will have a periodicity of ___ samples | N | L | $N(N-1)$ | $N * N$ | N |
| 17 | Computation of linear filtering of a sequence using FFT algorithm requires no. of complex additions are | $(N/2)\log N$ | $2N\log N$ [Base=2] | $(N/2)\log N$ [Base=2] | $N\log N$ [Base=2] | $N\log N$ [Base=2] |
| 18 | Which filter is best to remove salt and pepper noise? | Low pass | Sobel | Median | Laplacian | Median |
| 19 | In which case power law of transformation is used | purification | industry | radar | MRI | MRI |
| 20 | While performing negative of a 3 bpp image the pixel value '5' will transform to | 2 | 5 | 8 | 0 | 2 |
| 21 | Which is true about bit plane slicing? | Highest order plane contains most of the information of an image | Lowest order plane contains most of the information of an image | Mid order plane contains most of the information of an image | All plane contains equal information of an image | Highest order plane contains most of the information of an image |
| 22 | In neighborhood processing methods | All the pixels in the neighborhood are processed at a time | A pixel in the neighborhood is processed using the current pixel | A pixel is processed using all the pixels within the neighborhood | A pixel is processed using its own current value | processed using all the pixels within the neighborhood |

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| 23 | Histogram processing loses ____ of the pixels of an image. | information | intensity | position | content | position |
| 24 | Laplacian operator is rotation invariant because | it is two dimensional in nature | it is one Dimensional in nature | it rotates very fast with respect to the centre pixel | Rotating the image and then applying the operator or rotating the operator and then applying on the image | Rotating the image and then applying the operator or rotating the operator and then applying on the image |
| 25 | Point, line, edge detectors are based on ____ of an image | Similarity | equality | discontinuities | nature | discontinuities |