SampleQuestionsCom

puterEngineering

SubjectName:DigitalSignalandImageProcessing **Semester:VI**

MultipleChoiceQuestions

	Choosethecorrectoptionforfollowingquestions.AlltheQuestions carryequalmarks
1.	Ifx(n)isadiscrete-timesignal,thenthevalueofx(n)atnonintegervalueof 'n'is:
OptionA:	Zero
OptionB:	Positive
OptionC:	Negative
OptionD:	Notdefined
Answer	Notdefined
2.	Thefunctiongivenbytheequationx(n)=1,forn=0;andx(n)=0,forn≠0is
OptionA:	Stepfunction
OptionB:	Rampfunction
OptionC:	Triangularfunction
OptionD:	Impulsefunction
Answer	Impulsefunction
3.	Whichofthefollowingshouldbedoneinordertoconvertacontinuous-timesignaltoa discrete-timesignal?
OptionA:	Sampling
OptionB:	Differentiating
OptionC:	Integrating
OptionD:	Noneofthementioned
Answer	Sampling
4.	Whatisoutputsignalwhenasignalx(t)=cos(2*pi*40*t)issampledwitha samplingfrequencyof20Hz?
OptionA:	cos(pi*n)
OptionB:	cos(2*pi*n)
OptionC:	cos(4*pi*n)
OptionD:	cos(8*pi*n)
Answer	cos(4*pi*n)
5.	Whichofthefollowingistrueregardingthenumberofcomputationsrequires tocomputeanN-pointDFT?
OptionA:	N2complexmultiplicationsandN(N-1)complexadditions
OptionB:	N2complexadditionsandN(N-1)complexmultiplications
OptionC:	N2complexmultiplicationsandN(N+1)complexadditions
OptionD:	N2complexadditionsandN(N+1)complexmultiplications
Answer	N2complexmultiplicationsandN(N-1)complexadditions
6.	WhatistheDFTofthefourpointsequencex(n)={0,1,2,3}?
OptionA:	{6,-2+2j-2,-2-2j}
OptionB:	{6,-2-2j,2,-2+2j}
OptionC:	{6,-2+2j,-2,-2-2j}
OptionD:	{6,-2-2j,-2,-2+2j}

Answer	{6,-2+2j,-2,-2-2j}
7.	Whatistheorderofthefouroperationsthatareneededtobedoneonh(k)inordertoconvolutex(k) andh(k)? Step-1:Folding Step-2:Multiplication withx(k)Step-3:Shifting Step-4:Summation
OptionA:	1-2-3-4
OptionB:	1-2-4-3
OptionC:	2-1-3-4
OptionD:	1-3-2-4
Answer	1-3-2-4
8.	AnLTIsystemissaidtobecausalifandonlyif?
OptionA:	Impulseresponseisnon-zeroforpositivevaluesofn
OptionB:	Impulseresponseiszeroforpositivevaluesofn
OptionC:	Impulseresponseisnonzerofornegativevaluesofn
OptionD:	Impulseresponseiszerofornegativevaluesofn
Answer	Impulseresponseiszerofornegativevaluesofn
9.	Ifx(n)=(0,0,1,1,1,1,1,0)thenx(3n+1)is?
OptionA:	(0,1,0,0,0,0,0,0)
OptionB:	(0,0,1,1,1,1,0,0)
OptionC:	(1,1,0,0,0,0,0,0)
OptionD:	Noneofthementioned
Answer	(0,1,0,0,0,0,0,0)
10.	Whichfunctionhasaprovisionofdeterminingthesimilaritybetweenthe signalanditsdelayedversion?
OptionA:	Auto-correlationFunction
OptionB:	Cross-correlationFunction
OptionC:	ConvolutionFunction
OptionD:	DFTfunction
Answer	Auto-correlationFunction
11.	Whichpropertyisexhibitedbytheauto-correlationfunctionofacomplex valuedsignal?
OptionA:	Commutativeproperty
OptionB:	Distributiveproperty
OptionC:	Conjugateproperty
OptionD:	Associativeproperty
Answer	Conjugateproperty
12.	In4-neighboursofapixelp,howfarareeachoftheneighbourslocatedfrom p?
OptionA:	onepixelapart
OptionB:	fourpixelsapart
OptionC:	alternatingpixels
OptionD:	noneoftheMentioned
Answer	onepixelapart
13.	Whatisthetechniqueforagray-leveltransformationfunctioncalled,ifthetransformationwouldbetoproduceanimage ofhighercontrastthantheoriginalbydarkeningthelevelsbelowsomegray-levelmandbrighteningthe levelsabovemintheoriginalimage.
OptionA:	Contouring
OptionB:	Contraststretching

OptionC:	Maskprocessing
OptionD:	Pointprocessing
Answer	Contraststretching
14.	WhatdoesthebilinearInterpolationdoforgray-levelassignment?
OptionA:	Assigngrayleveltothenewpixelusingitsrightneighbor
OptionB:	Assigngrayleveltothenewpixelusingitsleftneighbor
OptionC:	Assigngrayleveltothenewpixelusingitsfournearestneighbors
OptionD:	Assigngrayleveltothenewpixelusingitseightnearestneighbours
Answer	Assigngrayleveltothenewpixelusingitsfournearestneighbors
12	Forpixelsp(x,y),q(s,t),theEuclideandistancebetweenpandqisdefined as:
OptionA:	$D(p,q)=[(x–s)^2+(y–t)^2]^{1/2}$
OptionB:	D(p,q)=|x–s|+|y–t|
OptionC:	D(p,q)=max(|x–s|+|y–t|)
OptionD:	Noneofthementioned
Answer	$D(p,q)=[(x–s)^2+(y–t)^2]^{1/2}$
16.	Highlightingthecontributionmadetototalimagebyspecificbitsinsteadof highlightingintensity-levelchangesiscalledas:
OptionA:	Bit-planeslicing
OptionB:	IntensityHighlighting
OptionC:	Byte-Slicing
OptionD:	NoneoftheMentioned
Answer	Bit-planeslicing
17.	Whichofthefollowinginanimagecanberemovedbyusingsmoothing filter?
OptionA:	Sharptransitionsofbrightnesslevels
OptionB:	Sharptransitionsofgraylevels
OptionC:	Smoothtransitionsofgraylevels
OptionD:	Smoothtransitionsofbrightnesslevels
Answer	Sharptransitionsofgraylevels
18.	WhatisthefullformofJPEG?
OptionA:	JointPhotographsExpansionGroup
OptionB:	JointPhotographicExpansionGroup
OptionC:	JointPhotographicExpertsGroup
OptionD:	JointPhotographicExpandedGroup
Answer	JointPhotographicExpertsGroup
19.	Whichofthefollowingisthefirstfundamentalstepinimageprocessing?
OptionA:	Filtration
OptionB:	ImageRestoration
OptionC:	ImageEnhancement
OptionD:	ImageAcquisition
Answer	ImageAcquisition
20.	Whatisthenameofthetoolthathelpsinzooming,shrinking,rotating,etc.?
OptionA:	Filters
OptionB:	Interpolation
OptionC:	Sampling
OptionD:	Noneoftheabove
Answer	Interpolation
21.	Intensitylevelsin8-bitimageare:_____.
OptionA:	0—255
OptionB:	0—1024

OptionC:	0—128
OptionD:	0--64
Answer	0—255
22.	Thenumberofgreyvaluesareintegerpowersof:_____.
OptionA:	3
OptionB:	4
OptionC:	8
OptionD:	2
Answer	2
23.	TheOverlapSaveandOverlapAddmethodsareusedtocomputeDFTof .
OptionA:	Shortdatesequence
OptionB:	Moderatedatasequence
OptionC:	Bigsamplevaluesequence
OptionD:	Longdatesequence.
Answer	Longdatasequence.
24.	D.I.T.is_____.
OptionA:	DisseminationInTask.
OptionB:	DegradationInTime.
OptionC:	DisseminationInTime.
OptionD:	DisadvantageinTime.
Answer	DisseminationInTime.
25.	InFFT,howmanycomplexmultiplicationsarerequiredtocomputeX(k)?
OptionA:	N(N+1)
OptionB:	N(N-1)/2
OptionC:	N2/2
OptionD:	N(N+1)/2
Answer	N(N+1)/2
26.	Ifx(n)andX(k)areanN-pointDFTpair,thenX(k+N)=?
OptionA:	X(-k)
OptionB:	-X(k)
OptionC:	-X(-k)
OptionD:	X(k)
Answer	X(k)
27.	Whatisthenameofprocessusedtocorrectthepower-lawresponse phenomena?
OptionA:	Betacorrection
OptionB:	Alphacorrection
OptionC:	Gammacorrection
OptionD:	Piecorrection
Answer	Gammacorrection
28.	Whichofthefollowingmakeanimagedifficulttoenhance?
OptionA:	Narrowrangeofintensitylevels
OptionB:	Highnoise
OptionC:	Dynamicrangeofintensitylevels
OptionD:	Allofthementionedabove
Answer	Allofthementionedabove
29.	Thecircularconvolutionoftwosequencesintimedomainisequivalent to_____.
OptionA:	SquareofmultiplicationofDFTsoftwosequences
OptionB:	DifferenceofDFTsoftwosequences
OptionC:	SummationofDFTsoftwosequences

OptionD:	MultiplicationofDFTsoftwosequences
Answer	MultiplicationofDFTsoftwosequences
30.	Toconvertacontinuoussenseddataintodigitalform,whichofthefollowing isrequired?
OptionA:	Sampling
OptionB:	Quantization
OptionC:	BothSamplingandQuantization
OptionD:	NeitherSamplingnorQuantization
Answer	BothSamplingandQuantization

DescriptiveQuestions

Aparticulardigitalimagewitheightquantizationlevelhasthefollowinghistogramperformhistogramequalization.Givenewequalizedhistogram.

GrayLevels	0	1	2	3	4	5	6	7
No.ofPixelsbelongsto graylevel	200	170	130	60	60	80	140	160

Performthehistogramstretchingsothatthenewimagehavedynamicrange[0-7].

GrayLevels	0	1	2	3	4	5	6	7
No.ofPixelsbelongsto graylevel	100	90	85	70	0	0	0	0

Explaintheprocedureof Zoominganimageusingreplicationandinterpolationwithsuitable example.

Findtheconvolutionofthefollowingsequencesi)x(n)=u (n),h(n)=u(n-3)
ii)x(n)={1,2,-1,1},h(n)={1,0,1,1}

Foraperiodicsignalv(t)=30sin(2*pi*100t)+10cos(2*pi*300t)+6sin(2*pi*500t), findthefundamentalfrequencyinrad/sandNyquistsamplingrate.Obtainthediscretesignalx(n).

Determinetheresponseoftherelaxedsystemcharacterizedbytheimpulseresponse h[n]=0.5^nu(n)andinputx[n]=2^nu(n).

Ifx(n)={1,2,3,4}andh(n)={1,2,3,2}
a) FindCircularConvolutionusingDFTandIDFT?
b) FindLinearConvolutionusingCircularConvolutionusingDFTandIDFT?

Findtheoutputy(n)ofafilterwhoseimpulseresponseish(n)={1,1,1}andinputsignal x(n)={3,-1,0,1,3,2,0,1,2,1}usingoverlapsavemethod?

Obtaintheconvolutionfor twoD.T.sequencesx(n)=u(n)andy(n)=$(0.5)^n$u(n).

Twodiscretetimesystemsareconnectedincascade$h_1(n)=(0.5)^n$u(n)and$h_2(n)=(0.25)^n$u(n).Determineunitsampleresponseofcascade.

TheImpulseresponseofDT-LTIsystemh(n)=n$(1/2)^n$u(n).Determinewhetherthesystemis stable andcasual?

Asystemhasunitimpulseresponseh(n)=$(1/3)^{n+1}$u(n+1).Findtheresponseforunitstepinput?

Findtheoutputy(n)ofafilterwhoseimpulseresponseish(n)={1,1,1}andinputsignalx(n)={3,-1,0,1,3,2,0,1,2,1}usingoverlapsavemethod?

Performbitplaneslicingandobtainallbitplanesoffollowingimage

7	**3**	**5**	**4**
6	**2**	**4**	**3**
5	**7**	**6**	**0**
6	**7**	**4**	**3**

Showthatahighpassfiltercanbeobtainedas HighPass=Original–LowPass

Whatiszeropadding?Whatareitsuses?

Listandexplainanyfourpropertiesof DFT.

Howmanymultiplicationsandadditionsarerequiredtocompute NpointDFTusingRadix-2FFT?

Explaintheprocedureofneighborhoodprocessingtechnique?

Distinguishbetweenlinearconvolutionandcircularconvolutionoftwosequences.

Letx(n)=cos(n.π/2)u(n).FindD.F.T.ofx(n).

Comparethehighpassandlowpassfilteringinspatialdomain.

WhataredifferentapplicatorsofDSP?

DistinguishbetweenDiscreteSignalandAnalogsignals.

Whatarediffer entsignalsusedforanalysisofdiscretetimesignals?

Obtaintheautocorrelationofsequencex(n)=a^nu(n),0<a<1

Findthesignalenergyof$(1/2)^n u(n)$?

Obtainthedigitalnegativeofthe8bppimage

23	206	244	72	130
163	79	47	69	122
201	247	100	80	39
48	77	111	211	121

Whateffectwouldsettozerothehigher-orderbitplaneshaveonthehistogramofanimageingeneral?

TheimpulseresponseofaLTIsystemish(n)={1,2,1,1}.Whatistheresponseof thesignaltotheinputx(n)={1,2,3,4}?