T.E. (IT) (Sem III) (CBCGS)(P-20-21)94281 Image Processing (c scheme)

University of Mumbai Examinations summer 2022

Time: 2 hour 30 minutes Max. Marks: 80

Q1.	Choose the correct option for following questions. All the Questions are compulsory and carry equal marks							
1.	is not a lossless compression algorithm							
Option A.	Huffman coding							
Option B:	Arithmetic coding							
Option C:	Dictionary based coding							
Option D:	Vector quantization							
2.	Operations on single pixels of a digital image are known as							
Option A:	Point Operation							
Option B:	Diagonal Pixel Operation							
Option C:	Value Transformation							
Option D:	Neighbours pixel Operation							
3,	filter works best to remove salt and pepper noise.							
Option A:	Low pass							
Option B:	High pass							
Option C:	Median							
Option D:	Max							
4.	In technique an entire sequence of source symbol is assigned a single code.							
Option A:	Arithmetic Coding							
Option B:	LZW Coding							
Option C:	Huffman Coding							
Option D:	Run-length Coding							
5.	Three basic types of discontinuities are							
Option A:	Lines, Edges, Planes							
Option B:	Points, Lines, Planes							
Option C:	Edges, Lines, Points							

Option I	Point, Planes, Edges				
6.					
Option A	The starting pixel of region growing process is called				
	base pixel				
Option B	seed pixel				
Option C	original pixel				
Option D:	image pixel				
7.	is the foremost star. I				
Option A:	is the foremost step in Image Processing. Morphological Processing				
Option B:	Image acquisition				
Option C:					
Option D:	Segmentation				
	Compression				
8.	is not a property of 2D Discrete Fourier Transform.				
Option A:	Separability				
Option B:	Real				
Option C:	Periodicity				
Option D:	Conjugate				
9.	is not a region based segmentation technique.				
Option A:	Region growing				
Option B:	Split and merge				
Option C:	Region thinning				
Option D:	Region splitting				
10					
10.	is a horizontal line detection mask.				
Option A:	[2 -1 -1; -1 2 -1; -1 -1 2]				
	[1 2 -1; -1 2 -1; 1 2 -1]				
	[-1 -1 2; -1 2 -1; 2 -1 -1]				
ption D.	[-i -l -l; 2 2 2; -l -l -l]				

Q.2	So	olve any Four out of Six. [5 Marks I	Each]	Marks					
	A	List and define types of distance measures.		5					
	B Draw the different steps in digital image processing. C Show transform matrix for N=4 and Give three properties each:								
		(i) Discrete Walsh Transform (ii) Discrete Cosine Transform	m						
	D	Draw a block diagram showing processing of Homomorphic Filtering and explain the method.							
	Е	Explain in brief Hough Transform.		5					
	F	Give a DFT Transform matrix and Apply it to find transformed coefficients for $f(x) = \{2, 1, 3, 1\}$.							
Q.3	Sol	lve any Two Questions out of Three. [10 Marks	Each j						
	A	Perform histogram equalization for the following pixel distribution:		10					
		Gray Level 0 1 2 3 4 5 6 7							
		Frequency 10 0 4 15 25 6 0 4							
		Draw original histogram and equalized histogram.							
	В	Explain following morphological methods with example:		10					
		(i) Erosion (ii) Dilation							
	С	Illustrate Arithmetic Coding and Decoding.		10					
Q.4	Solv	ve any Two Questions out of Three. [10 Marks	Fach I						
	A	List all Point Processing Techniques and explain any two with example	- 1	10					
			1	10					
	В	Obtain the four directional Chain Code and Shape number representat 4-directional with the given starting point as shown in the image with d cell as pixel is the boundary of the object.	on using ark filled	10					

		List all region based segmentation techniques. Apply region based segmentation on a 3-bit image of size 4x4. Assume Threshold = 3, a pixel value 7 as starting point, and use 4-way connectivity.							
,			1	0	2	0			
	С		0	0	6	6			
			5	5	5	5			
			7	6	6	0			
					l.				

X:***X***