MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL (A constituent unit of MAHE, Manipal)

SEVENTH SEMESTER B. TECH. (INSTRUMENTATION AND CONTROL ENGG.)

END SEMESTER DEGREE EXAMINATIONS, DECEMBER – 2018

SUBJECT: DIGITAL IMAGE PROCESSING [ICE 4021]

TIME: 3 HOURS					MAX. MARKS: 50	MAX. MARKS: 50	
	Instruction	ons	to c	andi	dat	ies	
• Answer ALL questions.							
Missing data may be suitably assumed.							
1A	What are the fundamental steps in image pro	ces	sing	? Ex	pla	ain with neat diagram.	4
1B	Discuss the process of image acquisition using sensor strips and sensor arrays.						
1C	Mention the applications of image processing.						2
2A	Describe the followings with an example,						2
n	I) D4 distance ii) Gray-rever resolution Let $V = \{0, 1\}$ and compute the length of the shortest 4, 8, and m between p and c. If no path = 3						
ZD	exists between p and q. explain why?						
	3		1	2	2	1(a)	
	2		2	()	2	
	1		2	1		1	
	(p) 1		0	1	l	2	
2C	Explain histogram equalization and matching using suitable example.						5
3A	Apply the 3×3 weighted average mask using zero padding to an image shown in Fig.Q3 (A).						2
	1	2	4	5			
	5	2	5	2			
	1	1	3	6			
	2	4	6	7			
Fig $O3(A)$							
	-	-8*)			
3B	Explain the following with relevant graphs,i) Contrast stretching ii) Bit-plane slicing						3
3C	Draw neat block diagram of a homomorphic filtering approach and explain by deriving the expression for its results.						5
4A	A What is redundancy in an image? Explain any two types with an example.						
4B	3 Explain lossy predictive coding technique with active processing stages.						
4C	4C What are error-free compression techniques? Consider five symbols are encoded to 0.572 using 5						

arithmetic encoding and retrieve the original information using same technique (use the probability for the source symbol $P=\{0.2, 0.2, 0.4, 0.2\}$)

- 5A Mention different gray-level discontinuities in a digital image and explain the method used to 3 detect them. 2
- With mathematical formulation, explain any two morphological operations. 5B
- 5C Explain how LBP-operator works. With processing steps, describe color face recognition system 5 using local texture features.
