

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VII (NEW) EXAMINATION – WINTER 2021****Subject Code:3171109****Date:17/12/2021****Subject Name:Digital Image and Video Processing****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS																
Q.1	(a) Explain basic elements of Image processing system.	03																
	(b) Discuss basic relationship between pixels & also describe different neighborhood of pixels in image. processing.	04																
	(c) Explain Image sampling and quantization with necessary sketch.	07																
Q.2	(a) What is the difference between contrast stretching and histogram equalization?	03																
	(b) Explain below point processing technique. (i) Image Negative (ii)Power law Transformation	04																
	(c) What do you mean by order-statistic filter? Explain Median filtering with suitable example.	07																
OR																		
Q.3	(c) Explain Image smoothing filter with suitable example.	07																
	(a) Explain Butterworth Low pass filter in frequency domain with necessary diagram.	03																
	(b) Explain prewitt and sobel operator in detail.	04																
	(c) Find DFT of an image below	07																
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Q.3	(a) Explain RGB Color model in brief.	03																
	(b) How to segment the image? Explain image segmentation based on discontinuity in brief.	04																
	(c) Describe HSI color model & Also explain conversion fromRGB to HSI color model.	07																
Q.4	(a) What is Edge linking? Why it is required in image segmentation?	03																
	(b) Compare and contrast between lossy compression and lossless compression.	04																
	(c) Explain similarity based image segmentation in detail.	07																
OR																		
Q.4	(a) What is redundancy in image? List different types of redundancy available in the digital image.	03																
	(b) Discuss continuous wavelet transform with necessary equation.	04																

- (c) Explain arithmetic coding technique for loss-less data compression. What is advantage of arithmetic coding technique over Huffman coding technique? **07**
- Q.5** (a) Explain Inter frame redundancy. **03**
(b) Explain backward and forward motion estimation with necessary diagram. **04**
(c) Explain MPEG video coding standard in detail. **07**
- OR**
- Q.5** (a) Explain below terms in the context of video coding. **03**
(i) Slice (ii) Microblocks
(b) Explain Temporal segmentation in brief. **04**
(c) Discuss the below terms in detail **07**
(i) Hard-cuts and soft-cuts
(ii) Shot boundary detection
