Seat No.: _____   Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER–VII (NEW) EXAMINATION – WINTER 2023

Subject Code:3171109   **Date:01-12-2023**
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.**

Q.1	**(a)**	What do you mean by ringing effect?	**03**
	(b)	Using block diagram explain the fundamental steps in digital image	**04**
	(c)	Explain homomorphic filtering approach for image enhancement.	**07**
Q.2	**(a)**	What are the advantages of DCT over DFT?	**03**
	(b)	Explain HSI color Model	**04**
	(c)	What is histogram? Explain histogram equalization algorithm in detail.	**07**
		OR	
	(c)	Explain different padding techniques. Which is better and why?	**07**
Q.3	**(a)**	Explain the types of connectivity.	**03**
	(b)	Explain in brief: Region growing by pixel aggregation	**04**
	(c)	Explain image segmentation and basic approaches of image segmentation algorithms.	**07**
		OR	
Q.3	**(a)**	What is relative data redundancy R and compression ratio C? What is the mathematical relationship between R and C?	**03**
	(b)	Explain steps of filtering in the frequency domain using block diagram.	**04**
	(c)	Perform LZW compression on string "ABABBBABCABABBA".	**07**
Q.4	**(a)**	State the advantages and disadvantages of second order edge detector operators for Low level feature extraction.	**03**
	(b)	Explain JPEG Compression standard in brief	**04**
	(c)	Compare: Wiener filtering and inverse filtering.	**07**
		OR	
Q.4	**(a)**	Explain difference between: Hard-cuts and soft-cuts	**03**
	(b)	Write short note on motion tracking.	**04**
	(c)	Explain MPEG video coding standard in detail	**07**
Q.5	**(a)**	Explain in brief Shot boundary detection	**03**
	(b)	Explain Still frame stereo imaging.	**04**
	(c)	Explain backward and forward motion estimation with necessary diagram.	**07**
		OR	
Q.5	**(a)**	Explain below terms in the context of video coding. (i)Slice (ii) Microblocks	**03**
	(b)	Explain in brief sub-Nyquist spatio-temporal sampling	**04**
	(c)	Explain video object detection and tracking with proper example.	**07**

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