

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI  
(END SEMESTER EXAMINATION)**

**CLASS: MTECH  
BRANCH: CSE**

**SEMESTER : I  
SESSION : MO/2024**

**SUBJECT: CS532 IMAGE PROCESSING**

**TIME: 3 Hours**

**FULL MARKS: 50**

**INSTRUCTIONS:**

1. The question paper contains 5 questions each of 10 marks and total 50 marks.
  2. Attempt all questions.
  3. The missing data, if any, may be assumed suitably.
  4. Before attempting the question paper, be sure that you have got the correct question paper.
  5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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		CO	BL
Q.1(a)	Give an Overview of Image Processing systems. Discuss the various Image processing operations with examples.	[5] 1	2
Q.1(b)	Explain the roles of Data Structures in Image processing applications with examples.	[5] 1	2
Q.2(a)	What is the need for transforms? Discuss various transform with examples.	[5] 2	3
Q.2(b)	Apply DCT to the following sequence {2,4,6,1} & Find the eigen values and eigen vectors for the image $\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$	[5] 2	3
Q.3(a)	Discuss on Image Quality factors and Image Quality Metrics with Examples.	[5] 3	3
Q.3(b)	Discuss Histogram based techniques with examples.	[5] 3	3
Q.4(a)	Discuss Lossless compression algorithms with examples.	[5] 4	3
Q.4(b)	Construct Huffman code for the alphabets whose frequency is given as a=21, b=4,c=5, d=7,e=25, f=9, g=8, h=1,i=19	[5] 4	3
Q.5(a)	Explain the various stages of Edge detection with examples.	[5] 5	2
Q.5(b)	Find the gradient vector and Hessian Matrix for the matrix and explain how it helps in Image processing. $\begin{bmatrix} 2xy & 2xy^2 & 3y^2x^3 \\ 4xy & 4y^3x^3 & 2y^2 \\ 24x^3 & 3y^1x^3 & 3y^2x^2 \end{bmatrix}$	[5] 5	3

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