No. of Printed Pages : **4**

Sl. No.

C7-R4 : DIGITAL IMAGE PROCESSING & COMPUTER VISION

DURATION : 03 Hours **MAXIMUM MARKS : 100**

Roll No. : | | | | | | |

Answer Sheet No. : | | | | | | |

Name of Candidate : _____ **; Signature of Candidate :** _____

INSTRUCTIONS FOR CANDIDATES :

- Carefully read the instructions given on Question Paper, Answer Sheet.
- Question Paper is in English language. Candidate has to answer in English Language only.
- **Question paper contains Seven questions. The Question No. 1 is compulsory. Attempt any FOUR Questions from Question No. 2 to 7.**
- **Parts of the same question should be answered together and in the same sequence.**
- **Questions are** to be answered in the **ANSWER SHEET** only, supplied with the Question Paper.
- **Candidate cannot leave the examination hall/ room without signing on the attendance sheet and handing over his/her Answer Sheet to the Invigilator. Failing in doing so, will amount to disqualification of Candidate in this Module/Paper.**
- After receiving the instruction to open the booklet and before answering the questions, the candidate should ensure that the Question Booklet is complete in all respects.

DO NOT OPEN THE QUESTION BOOKLET UNTIL YOU ARE TOLD TO DO SO.

1. (a) Explain the purpose and applications of Image Processing and Computer Vision.

(b) Describe the process of image sampling and quantization.

(c) Define adjacency and connectivity in the context of pixels.

(d) Explain the concept of bit-plane slicing in image enhancement.

(e) Differentiate between error-free and lossy image compression.

(f) Describe the basic principle of edge detection.

(g) Explain the concepts of erosion and dilation in morphological image processing.

(7x4)

2. (a) Explain the components of a typical image processing system with a neat block diagram.

(b) Describe the orthographic and perspective projection models used in image formation.

(9+9)

3. (a) Explain the process of histogram equalization and its advantages in image enhancement.

(b) Describe the 2D Discrete Fourier Transform (DFT) and its applications in low-pass filtering. Explain the Ideal low pass filter and Gaussian low pass filter.

(9+9)

4. (a) Discuss the various colour models used in image processing.

(b) Explain the concept of image pyramids and sub band coding in multi resolution processing.

(9+9)

5. (a) Describe the Huffman and LZW compression techniques.

(b) Explain the process of boundary detection and discuss the factors that affect its performance.

(9+9)

6. (a) Explain the concepts of opening and closing in morphological image processing and their applications.

(b) Describe the regularization theory in motion estimation.

(9+9)

7. (a) "In Medical Image Segmentation, Multi resolution analysis using snakes are used." Critically comment on this statement.

(b) Describe the different distance measures used in image processing.

(9+9)

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SPACE FOR ROUGH WORK