Roll No

Total No. of Pages : 02

Total No. of Questions : 09

B.Tech. (Computer Science & Engineering) (Sem.–7) COMPUTER VISION Subject Code : BTCS-708-18 M.Code : 90499 Date of Examination : 03-01-23

Time: 3 Hrs.

Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

- 1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
- 2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
- 3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION-A

- 1. Write briefly :
 - a. Give discrete memory representation of digital image signal.
 - b. Define image signal acquisition, sampling and quantization process.
 - c. Define aspect ratio and discuss it for high-definition display device.
 - d. Discuss image intensity range for a byte/pixel Gray-scale images.
 - e. What are image features and how these are recognized and stored?
 - f. Discuss intensity level segmentation in digital images.
 - g. What image histogram display and how it is constructed?
 - h. What is image feature vector and its importance in image processing tasks?
 - i. Differentiate binary, intensity and color images.
 - j. Define and discuss PCA and ICA applications in image processing.

SECTION-B

- 2. Write a pseudocode to segment an object in a b-bit image of $M \times N$ size having 256 Gray intensity levels.
- 3. Discuss and explain dilation, erosion, opening and closing operation in morphological image operations.
- 4. Discuss various classification methods for pattern recognition in digital images.
- 5. Discuss supervised, un-supervised and semi-supervised image classification techniques in image data classification.
- 6. What do you mean by dimensionality reduction? How it is useful in feature extraction and pattern matching applications?

SECTION-C

- 7. How imaging system pipeline is used in decision making tasks? Write down the stepwise procedure with labelled diagram to detect and match the human faces.
- 8. What is k-means clustering? Give one example of its use in digital image processing application of your choice. What it is outcome of this algorithm in reconstructed images?
- 9. Give different pixel neighbourhood connectivity methods. How the Euclidian distance is applied to measure pixel distance in an image processing application. Elaborate and justify your answer with suitable example.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.