

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

September / October 2023 Supplementary Examinations

Programme: B.E.

Branch: ES – Cluster Elective

Course Code: 19EC6CE1CV

Course: Computer Vision

Semester: VI

Duration: 3 hrs.

Max Marks: 100

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

UNIT - I

- 1 a) What is K Means Algorithm? Mention the Criteria of objective functions with different proximity measures in detail. Also list out the merits and demerits of the same. **10**
- b) Define a classifier. Mention the mistakes of a two class classifiers? Give the importance of risk function in classification strategy. Suggest a solution to minimize the risk of a two class classifier and multi class classifiers. **10**

UNIT - II

- 2 a) Prove that the auto correlation surface is a factor dependent on Image gradient. Bring out the significance of addressing the Aperture problem during feature detection and explain in detail. **10**
- b) “Most Feature detectors can lead to uneven distribution of feature points” Suggest a suitable technique to mitigate the problem in detail. **10**

OR

- 3 a) What is edge detection? Describe the different techniques involved in edge detection. **08**
- b) How can we make image descriptors more invariant preserving discriminability between different Patches? Explain the different descriptors in detail. **07**
- c) “Even though some design discriminators are rotationally invariant they have poor discriminability”. Suggest a suitable method to overcome the drawback **05**

UNIT - III

- 4 a) Explain the following: a) Active Contours, b) Elastic Nets, c) Deformable Surfaces, d) Fourier Descriptors. **08**
- b) Identify and explain an algorithm which employs factored sampling using particle filtering. List atleast four real time applications for the same. **08**
- c) What is the importance of Splines and Shape Priors? **04**

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

UNIT - IV

- 5 a) "It is required to obtain image sections through a sample without performing physical sectioning". Suggest and explain a suitable approach to accomplish the same. **06**
- b) What are the different lattice configuration arrangements in atoms? Comment on voxel arrangements in cubic array. **08**
- c) Suggest and explain any method to enhance the visibility of structures in 3D processing. **06**

OR

- 6 a) What is the importance of resolution reduction? Suggest a suitable technique to reduce the size of storage requirements. **06**
- b) Explain ray tracing? What are the variables available for ray tracing? **06**
- c) Define Stereo matching. Describe the different approaches for matching stereo pairs? What are the drawbacks of stereo pairs? **08**

UNIT - V

- 7 a) "As an increasing number of paperless works, a digital signature can be the safeguard of valuable data"-Justify the statement highlighting the importance of secure digital signature. **06**
- b) What is Augmented Reality? Brief the characteristics of the AR environment. **06**
- c) With the help of a neat block diagram explain the working of biometric systems also explain the different authentication methods and the attributes of biometric data. **08**
