**[BCE7518]**

|  |  |  |
| --- | --- | --- |
|  | Pimpri Chinchwad Education Trust's **Pimpri Chinchwad College of Engineering** An Autonomous Institute (Permanently affiliated to Savitribai Phule Pune University) | **SEMESTER - VII** |

|  |
| --- |
| **Summative Assessment Examination** |

|  |
| --- |
| Final Year B. Tech. (Computer Engineering) |

|  |
| --- |
| Computer Vision [Professional Elective Course-6] |

|  |
| --- |
| [BCE7518] |

|  |
| --- |
| Even Semester (2024-25) |

|  |  |  |
| --- | --- | --- |
| Total No. of Questions-5 | [Time: 2 Hr] | [Max. Marks: 60] |
| Total No. of Printed Pages-01 |  |  |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **PRN** |  |  |  |  |  |  |  |  |  |  |

**Instructions:**

IMP: Verify that you have received a question paper with the correct course, code, branch, etc.

i. Q.1 is Compulsory. Attempt Q.2 or Q.3, Q.4 or Q.5

ii. Assume suitable data wherever necessary.

iii. Neat labelled diagrams must be drawn wherever necessary.

iv. The figure to the right indicates full marks.

v. Use of a non-programmable calculator is allowed.

**Q1: Solve any one**

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No.** | **Question** | **CO** | **Marks** |
| A | Apply model fitting techniques to a set of 2D points to fit a line or curve. How do you handle noise in the data to get an accurate fit? | CO1 | 5 |
| B | Use thresholding techniques to convert a grayscale image into a binary image. | CO1 | 5 |

**Q2: Solve any one**

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No.** | **Question** | **CO** | **Marks** |
| A | High-pass filter enhances high-frequency components in image processing why? | CO2 | 5 |
| B | How do autonomous vehicles integrate 2D camera data with 3D LiDAR or radar data to improve obstacle detection and navigation accuracy? | CO2 | 5 |

**Q3: Solve any three**

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No.** | **Question** | **CO** | **Marks** |
| A | Using 3D medical image segmentation use case elaborate the concept of convolutional neural networks (CNNs) with neat diagrams also enlist the advantages of CNN in image processing in detail. | CO3 | 5 |
| B | Using Next word prediction in sentence use case elaborate the concept of convolutional neural networks (CNNs) with neat diagrams also enlist the advantages of CNN in image processing in detail. | CO3 | 5 |
| C | Using Visual Search use case elaborate the concept of convolutional neural networks (CNNs) with neat diagrams also enlist the advantages of CNN in image processing in detail. | CO3 | 5 |
| D | Elaborate the concept of convolutional neural networks (CNNs) with neat diagrams and how they are used in computer vision. | CO3 | 5 |

**Q4: Solve any three**

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No.** | **Question** | **CO** | **Marks** |
| A | Consider a scenario of object detection, analyze and perform feature extraction, and gradient calculation for CNN model. | CO4 | 5 |
| B | Evaluate the size of a feature map, given that the image size is 32x32, filter size is 5x5, stride is 1, and no padding. | CO4 | 5 |
| C | If we give the input a 3-D image to the network of dimension 39 X 39, then determine the dimension of the vector after passing through a fully connected layer in the architecture. | CO4 | 5 |
| D | An input image has been converted into a matrix of size 12 X 12 along with a filter of size 3 X 3 with a Stride of 1. Determine the size of the convoluted matrix. | CO4 | 5 |