Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **14EC3071** | **Duration :** | **3hrs** |
| **Sub. Name :** | **DIGITAL IMAGE PROCESSING** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | Marks |
| 1. | a. | How will you enhance the image quality using arithmetic and logic operations? | CO1 | 10 |
| b. | Discuss the use of power law and contrast stretching transformations on digital images. | CO1 | 10 |
| (OR) | | | | |
| 2. | a. | How will you improve the contrast of the images using spatial domain sharpening filters? Also, explain the steps involved in Laplacian filtering process. | CO1 | 15 |
| b. | What is the need for image compression?What is the storage space required to store an 8 bit level grey image with dimension 256×512? | CO1 | 5 |
| 3. | a. | How will you perform image smoothing using frequency domain filters? Support your answer with necessary mathematical equations. | CO2 | 15 |
|  | b. | Write short notes on histogram equalization. | CO1 | 5 |
| (OR) | | | | |
| 4. | a. | With necessary mathematical steps, illustrate the methodology of homomorphic filtering in digital images. | CO2 | 15 |
|  | b. | Comment briefly on the various color models available for image processing. | CO2 | 5 |
| 5. | a. | Illustrate the process of image restoration using degradation models. | CO2 | 10 |
|  | b. | Comment briefly on the various noise probability density functions used in the image restoration process. | CO2 | 10 |
| (OR) | | | | |
| 6. | a. | With mathematical expressions, explain the process of weiner filtering in digital images. | CO3 | 10 |
|  | b. | Explain the following morphological operators in detail:   1. Erosion, (b) Dilation, (c) Opening, (d) Region filling and (e) Thickening | CO3 | 10 |
| 7. | a. | Bring out the technical concepts of mean filters and order statistics filters used for image restoration | CO3 | 15 |
|  | b. | Give the mathematical expressions of any five noise probability density functions used in image processing. | CO3 | 5 |
| (OR) | | | | |
| 8. | a. | Comment briefly on the various thresholding concepts used in digital image processing techniques. | CO3 | 10 |
|  | b. | Explain the inverse filtering process for restoring the original image from the noise corrupted image. | CO3 | 10 |
|  | | **Compulsory:** |  |  |
| 9. |  | How will you detect the (a) points, (b) lines and (c) edges using various masks in digital images? | CO3 | 20 |