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 – April/May – 2017**

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| **Code :** | **16EC2001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **FUNDAMENTALS OF 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. | Explain about human visual system in detail with relevant diagrams. Explain about image formation process also. | CO1 | 15 |
| b. | Write short notes on sampling and quantization. | CO1 | 5 |
| (OR) | | | | |
| 2. | a. | Discuss the variety of image transforms available and differentiate them based on applications. | CO1 | 10 |
| b. | With a block diagram describe the fundamental steps of digital image processing. | CO2 | 10 |
| 3. | a. | Explain the properties of 2D Fourier Transform. | CO2 | 6 |
|  | b. | What is histogram? Explain histogram equalization. | CO2 | 14 |
| (OR) | | | | |
| 4. | a. | Explain image enhancement by point processing methods. | CO2 | 10 |
|  | b. | Discuss about region based image segmentation techniques. Compare threshold region based techniques. | CO2 | 10 |
| 5. | a. | Explain in detail the use of first order derivative operators. Explain about Canny Edge operator. | CO2 | 16 |
|  | b. | Explain about region growing algorithm. | CO2 | 4 |
| (OR) | | | | |
| 6. |  | What are two main types of Data compression? Illustrate the need for Compression? | CO3 | 20 |
| 7. | a. | Obtain the Huffman code for the word “COMMITTEE” and find its entropy. | CO3 | 12 |
|  | b. | With an example show the working of LZW coding. | CO3 | 8 |
| (OR) | | | | |
| 8. | a. | A source emits four symbols {a, b, c, d} with the probabilities 0.4, 0.2, 0.1, and 0.3 respectively. Construct arithmetic coding to encode and decode the word “dad” | CO3 | 14 |
|  | b. | Write a brief note on JPEG. | CO3 | 6 |
|  | | **Compulsory:** |  |  |
| 9. |  | With neat diagrams explain about morphological algorithms. . | CO3 | 20 |

ALL THE BEST