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**

|  |  |  |  |
| --- | --- | --- | --- |
|  |  |  |  |
| **Code :** | **15EI2013** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MEDICAL IMAGE COMPUTING** | **Max. marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Q. No. | Sub Div. | Questions | Course  Outcome | Marks |
| 1. | a. | What effect would setting to zero the lower-order bit planes have on the histogram of an image in general? Show that a second pass of histogram equalization on an image will produce exactly the same result as the first pass. | CO3 | 12 |
| b. | Discuss the phenomena that depicts the limitation of human visual system. | CO2 | 8 |
| (OR) | | | | |
| 2. | a. | Construct the first and second order derivative operators for image enhancement. Discuss their use. | CO1 | 14 |
| b. | Illustrate the procedure for image filtering. | CO3 | 6 |
|  |  |  |  |  |
| 3. | a. | Sow the flow of image restoration process. | CO1 | 3 |
|  | b. | Investigate how Wiener filter performs better than inverse filtering. | CO1 | 10 |
|  | c. | Discuss briefly on constrained least mean square filtering. | CO3 | 7 |
| (OR) | | | | |
| 4. | a. | Describe the ways to obtain prior knowledge about the degradation for restoring images. | CO1 | 10 |
|  | b. | Compare and contrast inverse filter and pseudo-inverse filter. | CO3 | 4 |
|  | c. | Discuss any two noise model. | CO1 | 6 |
|  |  |  |  |  |
| 5. | a. | Illustrate how image compression can be achieved using LZW coding | CO2 | 12 |
|  | b. | Discuss the following codings (i) run-lenth and (ii) transform coding. | CO3 | 8 |
| (OR) | | | | |
| 6. | a. | For the following data P(a1) = 0.1, P(a2) = 0.4, P(a3) = 0.06, P(a4) = 0.1, P(a5) = 0.04 and P(a6) = 0.3, find the encoded output using Huffman coding. | CO2 | 10 |
|  | b. | With necessary diagram describe the concept of predictive coding. | CO3 | 10 |
|  |  |  |  |  |
| 7. | a. | Compare the types of thresholding. Explain how image resulting from non-uniform illumination is difficult to segment by thresholding. | CO3 | 10 |
|  | b. | Write the basic formulation for region-based segmentation and discuss the method of segmentation using it. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Give the details of frequency domain filters for image smoothing and discuss their performance. | CO3 | 12 |
|  | b. | Discuss the following image transforms (i) DFT and (ii) Hadamard. | CO1 | 8 |
|  | | **Compulsory:** |  |  |
| 9. | a. | Find the shape number of shapes of order 6 and 8. | CO2 | 8 |
|  | b. | Describe the various regional descriptors. | CO2 | 12 |

**ALL THE BEST**