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



**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **18MA3006** | **Duration :** | **3hrs** |
| **Sub. Name :** | **SPARE REPRESENTATIONS AND COMPREHENSIVE SENSING** | **Max. marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Describe the following in compressed sensing (i) sparsity and incoherent sampling. | CO1 | 6 |
| b. | Brief the commonly used sensing matrics. | CO1 | 8 |
| c. | List the type of compressed sensing recovery algorithms. | CO1 | 2 |
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| 2. | a. | With necessary diagram describe the methods for obtaining SAR images. | CO2 | 8 |
| b. | Discuss on the following (i) slow-time undersampling and  (ii) compressive passive millimeter wave imaging. | CO1 | 8 |
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| 3. | a. | Give the details about background subtraction using compressed sensing. | CO2 | 6 |
| b. | With necessary diagrams illustrate the idea behind coded strobing camera. | CO2 | 10 |
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| 4. | a. | For the given dictionary B = [b1, b2, …,bL] ϵ RN × L define the mutual coherence of the matrix B. | CO1 | 4 |
| b. | With the flow chart describe the various stages of sparse representation based iris recognition. | CO2 | 12 |
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| 5. | a. | Explain how the row-sparse matrix is recovered using Kernel Simultaneous Orthogonal Matching Pursuit algorithm. | CO1 | 10 |
| b. | Discuss on multimodal multivariate sparse representation. | CO1 | 6 |
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| 6. | a. | Suggest the approach to solve the basis pursuit denoising problem and estimation of residual error towards sparse representation based classification. | CO1 | 8 |
| b. | Discuss how the sparse vector in the feature space is obtained using Kernel Orthogonal Matching Pursuit (KOMP) algorithm. | CO1 | 8 |
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| 7. | a. | Write the details of sparse representation for multimodal classification problem. | CO2 | 10 |
| b. | How the data contamination is addressed in sparse multimodal biometric recognition? | CO2 | 6 |
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| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Explain the details of MOD and KSVD algorithms towards training dictionaries for discrimination applications | CO2 | 12 |
| b. | Discuss on Non-linear Kernel dictionary learning | CO1 | 8 |

Question No 1,2,3,4,5 from module 1,2,3,4,5 respectively.

Q.No 6,7 from any of the 5 modules(1-5).