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

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

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| **Code :** | **17CS3075** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MACHINE LEARNING TECHNIQUES** | **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 the linear models for regression. | CO1 | 10 |
| b. | Describe about Bayesian linear regression. | CO1 | 10 |
| (OR) | | | | |
| 2. |  | Write about the following   1. Bias variance decomposition. 2. Linear basis function models. | CO2 | 20 |
|  |  |  |  |  |
| 3. | a. | Explain about Fisher’s discriminant for multiple classes. | CO3 | 10 |
| b. | Demonstrate the various probabilistic discriminative models. | CO3 | 10 |
| (OR) | | | | |
| 4. | a. | Express the Hessian matrix for *diagonal* and *outer product* approximation. | CO2 | 10 |
| b. | What do you mean by mixture density networks? Explain. | CO2 | 10 |
|  |  |  |  |  |
| 5. |  | Explain the following dimensionality reduction techniques.   1. Principal Component Analysis 2. Independent Component Analysis | CO4 | 20 |
| (OR) | | | | |
| 6. | a. | Explain about the expectation maximization (EM) algorithm for Gaussian mixtures. | CO5 | 10 |
| b. | Explain the K-means clustering for the application of image processing. | CO4 | 10 |
|  |  |  |  |  |
| 7. |  | What are the different inferences in graphical models? Explain each of the inferences. | CO5 | 20 |
| (OR) | | | | |
| 8. |  | Explain about the Markov Random Fields and illustrate the scenario with image denoising application. | CO6 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. | a. | Write about the basic sampling algorithms. | CO5 | 10 |
| b. | Explain about deterministic and non deterministic rewards and actions. | CO6 | 10 |