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

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

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| **Code :** | **18MA3007** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MEMBRANCE COMPUTING AND SPIKING NEURAL P SYSTEMS** | **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. | Discuss about maximal parallelism in the computation of P system. | CO1 | 10 |
|  | b. | Discuss the motivation for defining membrane structure and symport antiport rules in a P system. | CO1 | 10 |
| (OR) | | | | |
| 2. |  | Define and explain Cell – like P systems with multiset rewriting rules using a suitable example. | CO2 | 20 |
|  |  |  |  |  |
| 3. |  | Define and explain splicing P systems with an example. | CO2 | 20 |
| (OR) | | | | |
| 4. |  | Prove that | CO3 | 20 |
|  |  |  |  |  |
| 5. |  | Explain i) Region-based Segmentation Method.  ii) Edge-based Segmentation Methods. | CO3 | 20 |
| (OR) | | | | |
| 6. | a. | Discuss retinal image processing using membrane computing. | CO4 | 10 |
| b. | Describe the relation between Algebraic topology and Natural computing. | CO4 | 10 |
|  |  |  |  |  |
| 7. |  | Define SN P system and explain the generation of set of even numbers using SN P system. | CO5 | 20 |
| (OR) | | | | |
| 8. |  | State and prove universality result for P systems. | CO5 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | Discuss i) SN P system for addition with an example.  ii) SN P system that performs subtraction with an example. | CO6 | 20 |