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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **14BI2010** | **Duration :** | **3hrs** |
| **Sub. Name :** | **COMPUTATIONAL SYSTEMS BIOLOGY** | **Max. Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Define the term Interval graph. How does applied graph theory prove the linearity of the gene based on Interval graph? Explain in detail. | CO1 | 20 |
| **(OR)** | | | | |
| 2. |  | Justify the statement “A gene regulatory network can be represented by a directed graph” with example. | CO1 | 20 |
|  |  |  |  |  |
| 3. |  | How does one analyze the Biological networks? Write in detail with example. | CO2 | 20 |
| **(OR)** | | | | |
| 4. |  | Explain in detail about Sequence by Hybridization (SBH) technique which involves building a miniature DNA array with example. | CO2 | 20 |
|  |  |  |  |  |
| 5. |  | Write in detail about the Regulation of Metabolic Pathways with example in terms of biochemical reactions. | CO1 | 20 |
| **(OR)** | | | | |
| 6. |  | Explain in detail about the methods for Detecting Protein-Protein Interactions (PPIs) with three example and mention the importance of Protein-Protein Interactions (PPIs). | CO3 | 20 |
|  |  |  |  |  |
| 7. |  | Write in detail about the Gene clustering and Microarrays data Analysis with example. | CO3 | 20 |
| **(OR)** | | | | |
| 8. |  | How do we setup the Microarray Experiments? Write in detail with example. | CO3 | 20 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Use the Eulerian path approach to solve the SBH problem for the following spectrum:  *S* = {ATG, GGG, GGT, GTA, GTG, TAT, TGG}  Label edges and vertices of the graph, and give all possible sequences *s* such that *Spectrum* (*s, 3*) *= S* | CO2 | 10 |
| b. | Write in detail about the structure of Gene Regulatory Network (GRN) with example. | CO2 | 10 |