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 **PRESIDENCY UNIVERSITY**

  **Bengaluru**

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| **End - Term Examinations – JANUARY 2025** |
| Date: 07 – 01- 2025 Time: 09:30 am – 12:30 pm |

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| **School:** SOCSE | **Program:** B. Tech-CSE |
| **Course Code :**CSE3079 | **Course Name :**Parallel Computing |
| **Semester**: VII | **Max Marks**:100 | **Weightage**:50% |

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| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** |
| **Marks** | **26** | **26** | **24** | **24** |

**Instructions:**

1. *Read all questions carefully and answer accordingly.*
2. *Do not write anything on the question paper other than roll number.*

**Part A**

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| **Answer ALL the Questions. Each question carries 2marks. 10Q x 2M=20M** |
| **1** | List the applications of parallel computing. | **2 Marks** | **L1** | **CO1** |
| **2** | How parallel computing works? | **2 Marks** | **L1** | **CO1** |
| **3** | Define the term superscalar execution. | **2 Marks** | **L1** | **CO1** |
| **4** | Expand: SIMD, MIMD | **2 Marks** | **L2** | **CO2** |
| **5** | What is the use of bus topology? | **2 Marks** | **L1** | **CO2** |
| **6** | Draw the diagram of static and dynamic tree network. | **2 Marks** | **L2** | **CO2** |
| **7** | Classify the types of decomposition techniques. | **2 Marks** | **L2** | **CO3** |
| **8** | List the characteristics of task interactions. | **2 Marks** | **L1** | **CO3** |
| **9** | Expand OMP and MPI. | **2 Marks** | **L2** | **CO4** |
| **10** | What is the use of distro\_Array? | **2 Marks** | **L1** | **CO4** |

**Part B**

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| **Answer the Questions Total 80 Marks.** |
| **11.** | **a.** | Illustrate the parallel processing mechanism with a diagram. | **20 Marks** | **L3** | **CO1** |
| **or** |
| **12.** | **a.** | Demonstrate the uniprocessor architecture with a diagram and explain super scalar execution with proper steps. | **20 Marks** | **L3** | **CO1** |
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| **13.** | **a.** | Illustrate One-to-all broadcast and all-to-one reduction using1. Mesh topology
2. Ring topology
 | **20 Marks** | **L3** | **CO2** |
| **or** |
| **14.** | **a.****b.** | Sketch the concept of granularity for adding 16 numbers.Interpret the one to all broadcast using hypercube topology | **10 Marks****10 Marks** | **L3****L3** | **CO2****CO2** |

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| **15.** | **a.****b.** | Solve the given problem using Recursive Decomposition technique (i). Find the Smallest of given Number (ii). Sort the given list

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| **5** | **12** | **11** | **1** | **10** | **6** | **8** | **3** | **7** | **4** | **9** | **2** |

Consider the task dependency graphs of the two database query decompositions: Find the critical path length, amount of work done and average degree of concurrency of the two task- dependency graphs? | **10 Marks****10 Marks** | **L3****L3** | **CO3****CO3** |
| **Or** |
| **16.** | **a.** | Explain different types of parallel algorithm models with diagrams. | **20 Marks** | **L3** | **CO3** |

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| **17.** | **a.****b.** | Write a program to find the smallest among N numbers using OpenMP.Create a MPI program to scatter data {39,45,67,72} with 4 processors. | **10 Marks****10Marks** | **L6****L6** | **CO4****CO4** |
| **Or** |
| **18.** | **a.****b** | Write a program to find the sum of 100 natural numbers using OpenMP. Create a program to process 1 to send out a message containing the integer 42 to process 2 using send () and receive () primitives using MPI | **10 Marks****10Marks** | **L6****L6** | **CO4****CO4** |