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**PRESIDENCY UNIVERSITY**

**Bengaluru**

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| **Ph.D. Course Work End Term Examinations – JAN-FEB 2025** |
| **Date:** 03 – 02- 2025 **Time:** 09:30 am – 12:30 pm |

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| **School:** SOE | **Program:** Ph. D | |
| **Course Code :** MAT840 | **Course Name :** Analysis of Algorithms and complexity | |
| **Semester**: | **Max Marks**:100 | **Weightage**:50% |

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| --- | --- | --- | --- | --- |
| **CO - Levels** | **CO1** | **CO2** | **CO3** | **CO4** |
| **Marks** | **25** | **25** | **25** | **25** |

**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 10 marks. 6Q x 10M=60Marks** | | | | |
| **1** | Explain Counting sort and Radix sort with an algorithm. | **10 Marks** | **M** | **CO1** |
| **2** | Explain Longest common sequence problem using algorithm. | **10 Marks** | **M** | **CO2** |
| **3** | Write a note on sum of subsets with an algorithm. | **10 Marks** | **M** | **CO3** |
| **4** | Write a note on 0/1 Knapsack problem of Backtracking approach with an algorithm. | **10 Marks** | **M** | **CO3** |
| **5** | Explain Node-cover problem with an algorithm. | **10 Marks** | **M** | **CO4** |
| **6** | Brief in detail about Class P and Class NP. | **10 Marks** | **M** | **CO4** |

**Part B**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Answer the Questions. Each question carries 20 marks 2Q x 20 = 40 Marks** | | | | | |
| **7.** | **a.**  **b.** | Explain Abstract Data types for Stack and Queues in detail using Algorithms.  Detail on efficiency of Algorithms | **15 Marks**  **5 Marks** | **H** | **CO1**  **CO 3** |
|  | | | | | |
| **8.** | **a.**  **b.** | Explain Optimal binary search tree in detail.  Differentiate between NP-hardness and NP-completeness. | **15 Marks**  **5 Marks** | **H** | **CO2**  **CO4** |

**\*\*\*\*\* BEST WISHES \*\*\*\*\***