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| **P. V. P. SIDDHARTHA INSTITUTE OF TECHNOLOGY** | **Regd. No:** |  |  |  |  |  |  |  |  |  |  |
| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S2** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis Lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 1**CO3-L3 |
| **Program:** 1. Write a program to store  10 employees records in priority queue. Retrieve the employee information based on their ages in increasing order. The employee record should maintain fields like EMPID ,Ename ,Designation, Age, Height.
2. Implement simple find and union algorithm to find the even and odd disjoint sets between 1 to 20 natural numbers.

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| **Testing:**Enter details for Employee 1: Employee ID: 1 Name: aa Designation: ass Age: 46 Height: 5.4Enter details for Employee 2: Employee ID: 2 Name: bb Designation: ass Age: 56 Height: 5.5Employee information based on ages in increasing order:Employee ID: 1, Name: aa, Designation: ass, Age: 46, Height: 5.4Employee ID: 2, Name: bb, Designation: ass, Age: 56, Height: 5.5 |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I**  | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis Lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 2**CO2-L3,  |
| **Program:** 1. Implement all pairs shortest path algorithm for the given graph using Dynamic programming approach. Starting with source vertex 1.

Floyd Warshalls Algorithm |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis Lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 11-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 3**CO2-L3,  |
| **Program:** a) Implement single source shortest path algorithm using greedy algorithm approach for the given graph. Starting with source vertex A.Dijkstra's Shortest Path Algorithm with Examples - javatpoint |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis Lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 4**CO3, L3  |
| **Program:** 1. Implement min and Max heap procedure using priority queue for the given list of elements.

 90, 34, 12, 53, 82, 48, 28, 39, 17, 80, 26, 37, 16, 48Also analyze the complexity of the problem.  |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I**  | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 5**CO2-L3  |
| **Program:** 1. Develop AVL tree for the given list of elements

 24, 56, 14, 38, 25, 39, 89, 100 |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 6**CO2-L3  |
| **Program:** a)Ms. Meghana a teacher had to sort the answer scripts of students in the ascending order of their class number. She has used a method to divide the unsorted scripts into 2 equal subsets; for each subset she recursively followed the same procedure till she ended up with one script in each set. She then combined all the sets subsequently in the order of class numbers till it formed a single set. What approach did she use? Simulate the same using a recursive procedure |

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| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 7**CO3-L3  |
| **Program:** a) Mr. Rakesh, Professor stores the students grade list for a subject ‘Y’ which contains student\_id, grade based on sorted order of student\_id. Mr. Rakesh plans to write an optimal search application to search the grade for a student having an ID as s\_id and print it onto the console, if s\_id does not exist print “RECORD NOT FOUND”. How did he achieve it? |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 8**CO4-L3  |
| **Program:** a) Mr. Hemanth, an engineer is assigned a task of constructing a connecting road from every district headquarters to the capital. Mr. Heamnth plans to develop a Minimum cost Spanning tree. Help Mr. Hemanth achieve this task. (Hint : Use Greedy approach algorithms to solve this problem) |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 9**CO3-L2  |
| **Program:** a) Develop program for DFS of a graph. |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 10**CO2-L3 |
| **Program:** a) Implement 4-Queens problem using suitable appropriate algorithm design technique |

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| **YEAR** | **SEMESTER** | **Programme** | **DURATION** |
| **Degree: B. TECH (PVP23)** | **II** | **I** | **B. Tech – CSE S3** | **3 HOURS** |
| **Course Code: 23CS3301**  | **SUBJECT: Advanced Data Structures & Algorithm Analysis lab** | Internal Lab Examination |
| **DEPARTMENT: CSE** | **DATE OF EXAM: 23-11-2024** | **AC Year: 2024-25** |
| **Instructions**:* Aim, Program/Task Steps and Result statement has to be written for the below question.
* Write the Program legibly with comments describing each section of it.
* Answer all the questions.
 | **SET: 11**CO2-L3 |
| **Program:** a) Implement 0/1 Knapsack problem using suitable appropriate algorithm design technique |