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| **Course Code:** | **CST-314** |  |
| **V Semester B.E. Computer Science and Engineering Test – I Examination**  **Design and Analysis of Algorithms [SHIFT-I]** | | |
| Time: 1 Hours] | | [Max. Marks: 15 |
| **All questions carry marks as indicate**  **Check the internal choices in each question** | | |

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| **Ques** | **Description of Question** | **Marks** | **CO/EO** |
| **Q.1)** | Double reference of array for creating path [between source and destination] in backward algorithm  -------- = -------- | **01** | **CO3/L1, L3** |
| **Q.1)** | Any two applications of travelling salesman problem | **01** | **CO3/L2** |
| **Q.1)** | The three directions used in find LCS between two strings. What is formula to add (+1) to previous results? When it is used. | **01** | **CO3/L2** |
|  | **Solve any one** |  |  |
| **Q.2)** | Perform binary search analysis on the following array.  Array = [-10, 5, 19, 34, 45, 78, 88, 90, 95, 104]  Comment on average number of comparisons required for successful and unsuccessful search. Draw the BST and comment on IPL and EPL relation. | **04** | **CO2/L3** |
| **Q.2)** | Implement Maximum sum sub array problem using DAC approach on following array  [-10, 56, 34, 78, -90, 120, -9, 19, 45, 67, -56]  Comment on complexity of algorithm. | **04** | **CO2/L2** |
|  | **Solve any one** |  |  |
| **Q.3)** | Implement Prim’s algorithm on the following graph. Write Prim’s algorithm and explain the complexity equation. Demonstrate the use of intermediate data structures. | **05** | **CO2/L2** |
| **Q.3)** | Write logic for compression and decompression using Huffman encoding / decoding scheme.  Write algorithm for traversal on Huffman tree during decoding operation.   |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | | Char | A | B | C | D | E | F | G | | Freq | 12 | 16 | 9 | 32 | 40 | 19 | 4 | | **05** | **CO2/L2** |

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|  | **Solve any one** |  |  |
| **Q.4)** | Write backward algorithm to find the shortest path for travel between source and destination on the following multistage graph. Implement the formulation and generate the contents of intermediate arrays like **bcost, “d” and “p”.**  scan0004.jpg | **03** | **CO3/L2** |
| **Q.4)** | Write LCS generation and printing algorithm. Generate the LCS matrix on two strings:  String 1: G D V E K S T N  String 2: E G D X K N T G | **03** | **CO3/L2** |