



Bangladesh Army University of Engineering & Technology (BAUET)

Department of Computer Science and Engineering (CSE)

Course Title: Data Structure and Algorithms II Course Code: CSE-2213

2nd Year 2nd Semester Batch: 16th CT-1 Summer-24

Marks: 15

Time: 30 Mins

- | | Marks |
|--|--------------|
| Q1. Explain Asymptotic analysis of an algorithm with an example. And demonstrate the following rate of growth in increasing order. 2^N , $n \log n$, n^2 , $n!$, $\log n$, n , n^3 . [CO-3, PO-3, C2, KP-5] | 5 |
| Q2. Solve the recurrence relation using master theorem
$T(n) = 9 T(n/3) + n$ | 5 |
| OR | |
| Solve the recurrence relation using substitution method.
$T(n) = 2T(n/2) + n$ | |
| [CO-3, PO-3, C2, KP-5] | |
| Q2. Prepare the sorted list using Quick sort algorithm for the following example
25,36,12,4,5,16,58,54,24,16,9,65,78
And identify Worst case and Average Case Complexity. [CO-3, PO-3, C2, KP-5] | 5 |

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Bangladesh Army University of Engineering & Technology (BAUET)
 Department of Computer Science and Engineering (CSE)
Class Test-02, Summer-2024
 2nd Year 2nd Semester

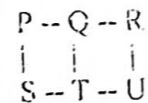
Course Code: CSE-2213; Course Title: Data Structures and Algorithms-II

Full Marks: 15

Time: 30 min

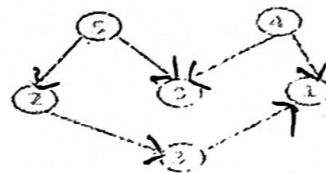
Sl.

01. Consider the following graph. Answer the following questions using Depth-First Search (DFS) and Breadth-First Search (BFS) starting from node P.

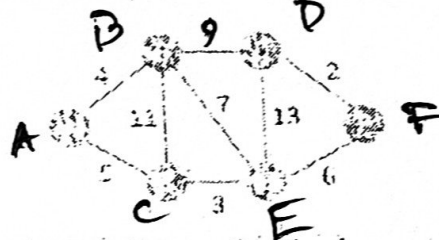


- i) Write down the traversal sequence using DFS.
- ii) Write down the traversal sequence using BFS.
- iii) Explain a situation where BFS would be more suitable than DFS, and vice versa.

02. Define Topological sort. Demonstrate the applications of topological sort. Apply topological sort to the following graph.



03. Using Dijkstra algorithm from the following graph find the shortest path between A to F.

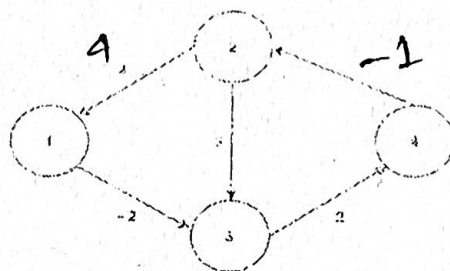
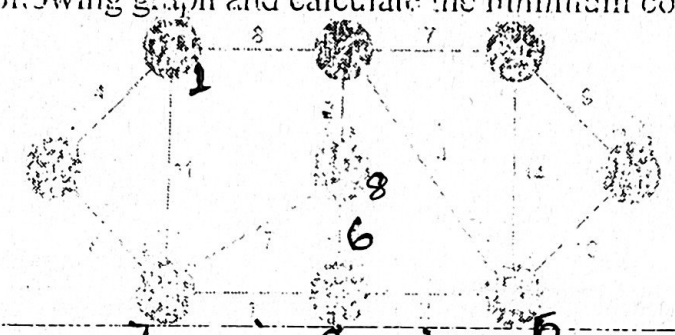


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CSE-2213

Time: 30 min

Full Marks: 15

SL		Marks
01	Explain the Bellman-Ford Algorithm. How does it differ from Dijkstra's Algorithm?	4
02	<p>Notice the following graph and compute the minimum cost to travel from vertex 1 to vertex 3 using Floyd-Warshall Algorithm.</p> 	5
03	<p>Apply Krushkal algorithm to the following graph and calculate the minimum cost from node '0' to node '4'.</p> 	6



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2nd Year 2nd Semester CT-4 Summer-24

Marks: 15

Time: 30 Mins

- | | Marks |
|--|--------------|
| <p>Q1. Construct the Huffman tree based on the frequency of each character in the given sentence.
Encode each character using the generated Huffman tree to obtain the binary representation.
Present the final binary code for the entire sentence. [CO-2, PO-2, C3, KP-3]</p> <p style="text-align: center;">"The quick brown fox jumps over the lazy dog."</p> | 5 |
| <p>Q2. Construct an expression tree for the expression $(a + b * c) + ((d * e + 1) * g)$. Identify the outputs when you apply preorder, inorder and postorder traversals.
[CO-2, PO-2, C3, KP-3]</p> | 5 |
| <p>Q3. Develop a splay tree for the given value 10, 17, 9, 7, 15, 13, 20, 30, 1, -1. After that perform search (-1) and delete (30) operation for that splay tree. [CO-2, PO-2, C3, KP-3]</p> | 5 |