8, 18, 5, 15, 17, 25, 40, 80 5+5=10

5. A file contains the following characters with the frequencies as shown. If Huffman Coding is used for data compression, determine-

a) Huffman Code for each character

b) Average code length

c) Length of Huffman encoded message (in bits) 4+3+3=10

Characters	Frequencies
a	10
e	15
i	12
o	3
u	4
s	13
t	1

6. Explain the Longest Common Subsequence problem with an example. Also, write an algorithm for the same. 10

7. Explain with a suitable example the working principle of merge sort. Also, write an algorithm for the same. 10

8. (a) Sort the following array in ascending order using quick sort algorithm. 5

25	10	30	15	20	28

(b) Write the algorithm for binary search and explain it with a suitable example. 5

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M. Tech Odd Semester Examination, February, 2023

Computer Science & Engineering

(1st Semester)

Course No.: MCSE-102 (Old)

(Advanced Data Structures)

Full Marks: 50

Pass Marks: 25

Time: 2 hours

Note:
1. Attempt any five questions.
2. Begin each answer in a new page.
3. Answer parts of a question at a place.
4. Assume reasonable data wherever required.
5. The figures in the right margin indicate full marks for the question.
6. All the mathematical symbols and abbreviations have their usual meanings.

1. What is hash collision? Discuss the different collision resolution techniques in hashing with examples. 2+8=10

2. Explain with an example the procedure for conversion of infix to prefix expression. Also, write an algorithm for the same. 10

3. (a) Explain with an example how a deletion operation is performed in Binary Search Tree. 5

(b) Construct an AVL tree having the following elements
H, I, J, B, A, E, C, F, D, G, K, L 5

4. Write the algorithm for insertion operation in Red Black Tree. Create a Red Black Tree by inserting the following sequence of number