	ADAMAS UNIVERSITY **END-SEMESTER EXAMINATION : JANUARY 2021** (Academic Session: 2020 – 21)		
Name of the Program:	BCA	**Semester:**	V
Paper Title :	Design and Analysis of Algorithm	**Paper Code:**	ECS33101
Maximum Marks :	40	**Time duration:**	3 Hours
Total No of questions:	8	**Total No of Pages:**	2
(Any other information for the student may be mentioned here)	*The figures in the margin indicate full marks.* *Candidates are required to give their answers in their own words as far as practicable.*		

Answer all the Groups

Group A

Answer all the questions of the following $5 \times 1 = 5$

1. **a)** What is an optimal Huffman code for alphabet "a" of the following set of frequencies a: 05, b:06, c:01, d:04, e:08, f:09, g:12, h:15

b) Define the divide and conquer method.

c) What is the substitution method?

d) Explain and calculate the Time complexity for the given code?

```
while(low <= high)
{
   mid = (low + high) / 2;
   if (target < list[mid])
      high = mid - 1;
   else if (target > list[mid])
      low = mid + 1;
   else break;
}
```

e) Define ADT? Explain with example?

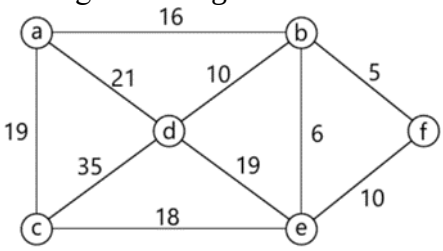
GROUP –B

Answer *any three* of the following $3 \times 5 = 15$

2. Generate Hash-Table for the given set of values based on the hash function (X mod 5) using linear probing approach: 13,22,19,42,8,9,7,5,11,45. 5

3. Explain different types of graphs using proper example? 5

4. Explain Prim's Algorithm? Using Prim's algorithm find minimum spanning tree for the following Graph. 1+4=5

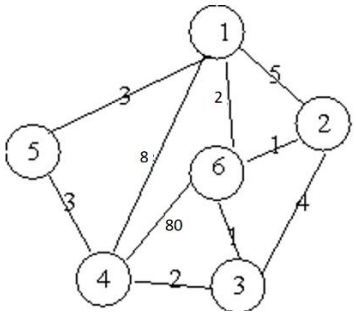


5. Explain Asymptotic Notations? 5

GROUP –C

Answer *any two* of the following $2 \times 10 = 20$

6. Write a sort note on B+-Tree? Using Floyd Algorithm calculate D and P matrix for the given Graph? 5+5=10



7. Perform Bucket Sort for the Following set of value showing each steps 1,2,3,1,2,4,5? Generate C table and M table for the following Knapsack Problem Size of the Bag is 8? 3+7=10

Item	1	2	3	4	5
Cost	2	4	1	2	7
Volume	3	4	2	1	2

8. Explain Merge Sort With time complexity analysis? Explain DFS with proper example? 5+5=10
