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- b) i) Consider pointer notation for the two-dimensional numeric arrays and with the following declaration fill up the table below for all values in 2D array.

(7+6)

```
int nums [2] [3] = { {16, 18, 20}, {25, 26, 27} };
```

Pointer notation	Array notation	Value
....

- ii) Write the output of the following program.

```
int main ()
{
    char arr [5] [7] [6];
    char (*p) [5] [7] [6] = &arr;
    printf ("%d\n", (&arr + 1) - &arr);
    printf ("%d\n", (char*) (&arr + 1) - (char*) &arr);
    printf ("%d\n", (unsigned) (arr + 1) - (unsigned) arr);
    printf ("%d\n", (unsigned) (p + 1) - (unsigned)p);
    return 0;
}
```

12. a) Write minimum of 30 overloaded operators and all the non-overloaded operators in C++ and write C++ code to overload post and pre increment operators.

(5+8)

(OR)

- b) Explain Dynamic Memory Allocation in C++ with examples for arrays and objects.

(13)

13. a) List standard exceptions in C++ and show how to define user defined exception with suitable example.

(6+7)

(OR)

- b) List the functions used with STL Lists. And use these functions to demonstrate STL list.

(6+7)

14. a) Explain amortized analysis and its types in detail.

(13)

(OR)

- b) Write pseudocode to perform rotation operation in splay tree.

(13)

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15. a) Write Kruskal's and Prim's (starts at F) Minimum Spanning Tree Algorithm and apply both techniques on the graph given below in Fig. 1. Can Prim's and Kruskal's algorithm yield different minimum spanning trees? Explain why or why not. (13)

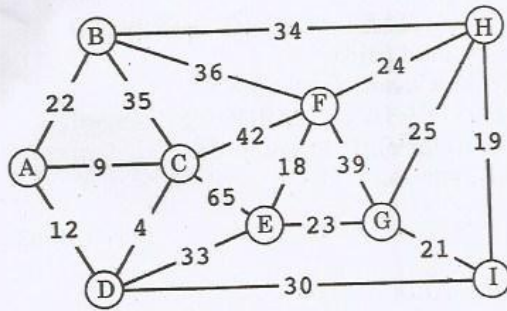


Fig. 1

(OR)

- b) Write algorithm to find shortest path using Dijkstra's method and apply the same to estimate shortest path from the graph given in Fig. 2. (13)

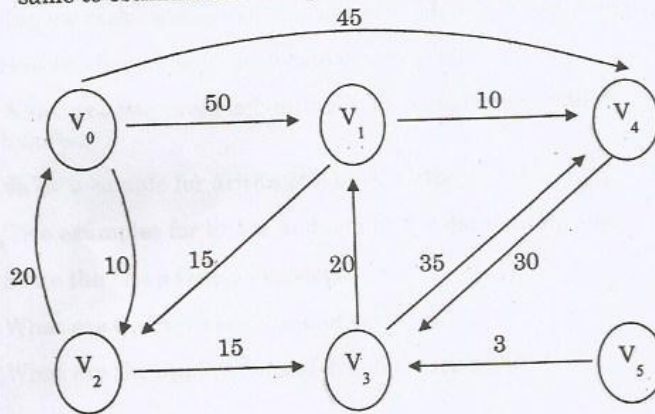


Fig. 2

PART - C

(1×15=15 Marks)

16. a) Write generic code in C++ to implement AVL tree insertion. And show the result of inserting 2, 1, 4, 5, 9, 3, 6, 7 into an initially empty AVL tree. (10+5)

(OR)

- b) Write a C++ code using function with multiple parameters to perform recursive binary search on a linear array. (15)