```python
graph = {
  '5': ['3', '7'],
  '3': ['2', '4'],
  '7': ['8'],
  '2': [],
  '4': ['8'],
  '8': []
}

def dfs_limited(graph, node, depth, visited=set()):
    if depth == 0:
        return False
    if node not in visited:
        print(node, end=" ")
        visited.add(node)
        if depth == 1:
            return False
        for neighbor in graph[node]:
            if dfs_limited(graph, neighbor, depth - 1, visited):
                return True
    return False

def ids(graph, start, max_depth):
    for depth in range(max_depth):
        visited = set()  # Reset visited nodes for each depth level
        print(f"\nDepth Level: {depth}")
        if dfs_limited(graph, start, depth + 1, visited):
            break

# Driver Code
print("Following is the Iterative Deepening Search")
ids(graph, '5', 5)  # Perform IDS starting from node '5' with a maximum depth of 5
```
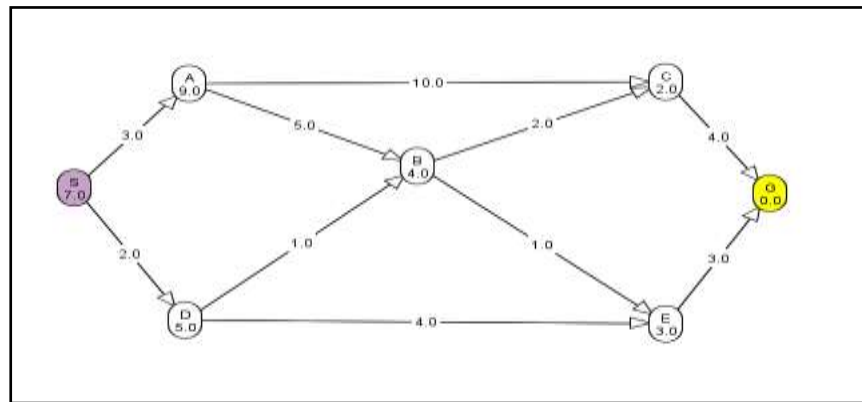
```
Depth Level: 0
5
Depth Level: 1
5 3 7
Depth Level: 2
5 3 2 4 7 8
Depth Level: 3
5 3 2 4 8 7
Depth Level: 4
5 3 2 4 8 7
```

BFS:


```
Algorithm Selected: Breadth First
CURRENT PATH:
  S --> A --> C --> G (Goal)
Path to last Goal Node: S --> A --> C --> G (Goal) Cost: 17.0
Nodes expanded: 10

NEW FRONTIER:
  Node: E    Path Cost: 4.0      h(E): 3.0    f-value: 7.0     Path: S-->D-->B-->E
  Node: C    Path Cost: 5.0      h(C): 2.0    f-value: 7.0     Path: S-->D-->B-->C
  Node: G    Path Cost: 9.0      h(G): 0.0    f-value: 9.0     Path: S-->D-->E-->G
  Node: G    Path Cost: 12.0     h(G): 0.0    f-value: 12.0    Path: S-->A-->B-->E-->G
  Node: G    Path Cost: 14.0     h(G): 0.0    f-value: 14.0    Path: S-->A-->B-->C-->G
```


Goal Node Reached ✕

Path found: S --> A --> C --> G (Goal)
Path cost: 17.0
Nodes expanded: 10

OK

DFS:


```
Algorithm Selected: Depth First
CURRENT PATH:
  S --> A --> B --> E --> G (Goal)
Path to last Goal Node: S --> A --> B --> E --> G (Goal) Cost: 12.0
Nodes expanded: 5

NEW FRONTIER:
  Node: C    Path Cost: 10.0     h(C): 2.0    f-value: 12.0    Path: S-->A-->B-->C
  Node: C    Path Cost: 13.0     h(C): 2.0    f-value: 15.0    Path: S-->A-->C
  Node: D    Path Cost: 2.0      h(D): 5.0    f-value: 7.0     Path: S-->D
```


Goal Node Reached ✕

Path found: S --> A --> B --> E --> G (Goal)
Path cost: 12.0
Nodes expanded: 5

OK