1)

2)

Node	Pre	Post
1	1	14
2	2	3
3	15	16
4	7	10
5	8	9
6	6	11
7	5	12
8	4	13

← Second DFS
starting at
Node 3

Vertex	Edge Type
(1,2)	Tree
(1,8)	Tree
(8,7)	Tree
(7,6)	Tree
(6,4)	Tree
(4,5)	Tree
(4,7)	Back
(3,4)	Cross
(3,5)	Cross
(3,7)	Cross
(3,8)	Cross

3)

i)

Node	Pre	Post
A	1	8
B	3	6
C	2	7
D	4	5
E	9	10
F	11	12

Topological Sort: $F \to E \to A \to C \to B \to D$

ii)

<u>Using Pre</u>

Topological Sort: $F \to E \to D \to B \to C \to A$

No, this is not valid.
Ex. (A,D) does not hold

4)

i)

```
for all u ∈ V:
    dist (u) = ∞
dist (s) = 0
Q = [s]

while Q is not empty:
    u = eject (Q)
    for all edges (u,v) ∈ E:
        if dist (v) = ∞:
            inject(Q,v)
            prev(v) = u
            dist (v) = dist (u) + 1
```

ii) Run time is $O(V+E)$