**Assignment 3**

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**Exe.1**

1. abcdef
2. adebcf
3. abdcef
4. adbecf
5. abdecf
6. adbcef

Thus the total number of topological ordering is 6.

**Exe.3**

We run the topological ordering algorithm with the following small modification. If in every iteration we find a node with no incoming edges, then we will succeed in producing a topological ordering. If in some iteration, it shows that every node has at least one incoming edge, then G must contain a cycle. Next, we find a cycle by following an edge into the node we are currently at. Since every node has an incoming edge, we can do this repeatedly until we re-visit a node v for the first time.