Q-4

the directed edges

$a \rightarrow b$

$a \rightarrow d$

$b \rightarrow c$

$d \rightarrow e$

$e \rightarrow f$

$c \rightarrow f$

the vertices of the graphs are $\{a, b, c, d, e, f\}$

1) choose a root node :-

(a) has no incoming edges so (a) will be our Root Node

2) Branching

from (a) we can branch into (b) and (d)

3) Ordering

use factorial for ordering

4) All Valid combinations

the ordering starts from (a), then can pick from (b) and (d)

Each combination lead to unique arrangement of the remaining vertics.

Vertices are {a, b, c, d, e, f}

- Vertex a must come before b and d
- Vertex b must come before c
- Vertex d must come before e
- Vertex e must come before f
- Vertex c can come before f but must be afte b

1. if (b) is before (d)

(a) → (b) → (c) → (d) → (e) → (f) — 1

a → (b) → (d) → (e) → (c) → (f) — 2

(a) → (b) → (d) → (e) → (f) → (c) — 3

2. if (d) is before (b)

(a) → (d) → (b) → (c) → (e) → (f) — 4

(a) → (d) → (b) → (e) → (c) → (f) — 5

(a) → (d) → (b) → (e) → (f) → (c) — 6

Thus the directed acyclic graph G (DAG) has a total of **6** distict Topological orderings

Total ways = 3 (b before d) + 3 (d before b) = 6