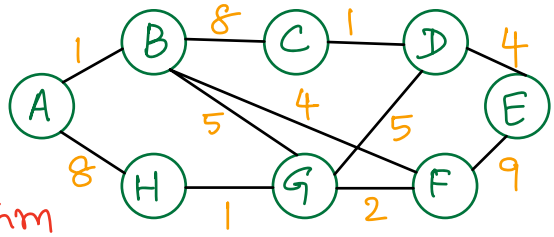
# PROBLEM SET-3



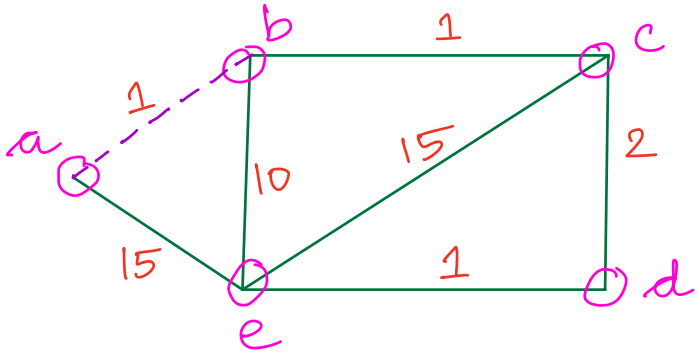

## QN - 1: Dijkstras Algorithm (computed at node A)

| Iteration | K | WAB, PAB | WAC, PAC | WAD, PAD | WAE, PAE | WAF, PAF | WAG, PAG | WAH, PAH |
|---|---|---|---|---|---|---|---|---|
| 0 | {A} | (1, A) | (∞, -1) | (∞, -1) | (∞, -1) | (∞, -1) | (∞, -1) | (8, A) |
| 1 | {A, B} | - | (9, B) | (∞, -1) | (∞, -1) | (5, B) | (6, B) | (8, A) |
| 2 | {A, B, F} | - | (9, B) | (∞, -1) | (14, F) | - | (6, B) | (8, A) |
| 3 | {A, B, F, G} | - | (9, B) | (11, G) | (14, F) | - | - | (7, G) |
| 4 | {A, B, F, G, H} | - | (9, B) | (11, G) | (14, F) | - | - | - |
| 5 | {A, B, F, G, H, C} | - | - | (10, C) | (14, F) | - | - | - |
| 6 | {A, B, F, G, H, C, D} | - | - | - | (14, F) | - | - | - |
| 7 | {A, B, F, G, H, C, D, E} | - | - | - | - | - | - | - |

QN-2 Bellman - Ford Algorithm (same fig as QN 1 ; use only node A as destination).

| Check Condition | $N_{BA}$ | $N_{CA}$ | $N_{DA}$ | $N_{EA}$ | $N_{FA}$ | $N_{GA}$ | $N_{HA}$ |
|---|---|---|---|---|---|---|---|
| 0 | (1, A) | (∞, -1) | (∞, -1) | (∞, -1) | (∞, -1) | (∞, -1) | (8, A) |
| 1 | (1, A) | (9, B) | (∞, -1) | (∞, -1) | (5, B) | (6, B) | (8, A) |
| 2 | (1, A) | (9, B) | (10, C) | (14, F) | (5, B) | (6, B) | (7, G) |

## QN-3 (Transient loops)




Dijkstra's algorithm at node 'e'.

| Iteration | Set K | $w_{ea}, p_{ea}$ | $w_{eb}, p_{eb}$ | $w_{ec}, p_{ec}$ | $w_{ed}, p_{ed}$ |
|---|---|---|---|---|---|
| 0 | {e} | (15, e) | (10, e) | (15, e) | (1, d) |
| 1 | {e, d} | (15, e) | (10, e) | (3, d) | (1, d) |
| 2 | {e, d, c} | (15, e) | (4, c) | (3, d) | (1, d) |
| 3 | {e, d, c, b} | (5, b) | (4, c) | (3, d) | (1, d) |
| 4 | {e, d, c, b, a} | (5, b) | (4, c) | (3, d) | (1, d) |

Packets from 'e' to 'a' doesnot directly go to 'a' even though 'a' is a neighbour to 'e'. This is because the routing table at 'e' shows $p_{ea}$ = 'b' But 'b' knows link 'b–a' has failed. Hence packets from 'e' cannot reach 'a' but loops between 'c' and 'b'. (Note: Dijkstra's table at b shows best path between b to a is b→c→d→e→a & routes it back to c).