**14.** (a) Reverse path: 5 turns, generating packets to : AC, DFIJ, DEGHIJKN, GHKN, and LMO (in terms of turns)

(b) Sink Tree: 14 packets over four turns

**23.** The warning bit is an explicit notification to the source, where the Random Early Detection method simply drops a packet and refuses to ack it. Also, the timing of packet dropping is different; RED drops packets based on statistical probabilities, where the warning bit is usedis a method that drops packets only the buffer is full (tail drop), possibly causing TCP global synchronization.

**25.** It is never possible to send a packet larger than 1KB in this case

**27.** S = C/(M − ρ) : ρ = 1 Mbps, C = 8 Mb, M = 6 Mbps. S = 1.6 seconds

**Problem 7:** Using D as a starting point, use Dijkstra's algorithm to compute the shortest paths to all other locations.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Step | **M** | **DA** | **DB** | **DE** | **DD** | **DF** | **DG** | DK | DM | DS |
| 1 | **D** | 3D | ∞ | 2D | **0D** | ∞ | ∞ | ∞ | ∞ | ∞ |
| 2 | **D, E** | 3D | 7E | **2D** | 0D | 6E | 8E | 11E | ∞ | ∞ |
| 3 | **D, E, A** | **3D** | 7E | *2D* | 0D | **6E** | 8E | 10A | ∞ | ∞ |
| 4 | **D, E, A, F** | *3D* | **7E** | *2D* | 0D | 6E | 8E | 10A | ∞ | ∞ |
| 5 | **D, E, A, F, B** | *3D* | 7E | *2D* | 0D | 6E | 8E | 10A | ∞ | 10B |
| 6 | **D, E, A, F, B, G** | *3D* | 7E | *2D* | 0D | 6E | **8E** | 10A | 10G | 10B |
| 7 | **D, E, A, F, B, G, K, M, S** | *3D* | 7E | *2D* | 0D | 6E | 8E | **10A** | **10G** | **10B** |

Nothing changes after step 7, so I removed the extra steps.

**Problem 8:** Using G as a starting point, use the Bellman-Ford algorithm to compute the shortest paths to all other locations.

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Hop | DA | DB | DD | DE | DF | DG | DK | DM | DS |
| 0 | ∞ | ∞ | ∞ | ∞ | ∞ | 0 | ∞ | ∞ | ∞ |
| 1 | ∞ | ∞ | ∞ | 6G | ∞ | 0 | 3G | 2G | ∞ |
| 2 | 11E | 11E | 8E | 6G | 10E | 0 | 3G | 2G | 14E |
| 3 | 10K | 11E | 8E | 6G | 10E | 0 | 3G | 2G | 9S |