

**COL334**  
**Eval A3-A4**  
**Part A**

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2019PH10629

**Q1 Routing Tables**

T = 29secs

1. Node A

```
Node: 2, Time: +29.0s, Local time: +29.0s, Ipv4ListRouting table
Priority: 0 Protocol: ns3::Rip
Node: 2, Time: +29.0s, Local time: +29.0s, IPv4 RIP table
```

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
10.0.5.0	10.0.1.2	255.255.255.0	UGS	2	-	-	2
10.0.6.0	10.0.1.2	255.255.255.0	UGS	3	-	-	2
10.0.4.0	10.0.2.2	255.255.255.0	UGS	2	-	-	3
10.0.3.0	10.0.2.2	255.255.255.0	UGS	2	-	-	3
10.0.0.0	0.0.0.0	255.255.255.0	U	1	-	-	1
10.0.1.0	0.0.0.0	255.255.255.0	U	1	-	-	2
10.0.2.0	0.0.0.0	255.255.255.0	U	1	-	-	3

2. Node B

```
Node: 3, Time: +29.0s, Local time: +29.0s, Ipv4ListRouting table
Priority: 0 Protocol: ns3::Rip
Node: 3, Time: +29.0s, Local time: +29.0s, IPv4 RIP table
```

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
10.0.6.0	10.0.5.2	255.255.255.0	UGS	2	-	-	3
10.0.4.0	10.0.3.2	255.255.255.0	UGS	2	-	-	2
10.0.2.0	10.0.1.1	255.255.255.0	UGS	2	-	-	1
10.0.0.0	10.0.1.1	255.255.255.0	UGS	2	-	-	1
10.0.1.0	0.0.0.0	255.255.255.0	U	1	-	-	1
10.0.3.0	0.0.0.0	255.255.255.0	U	1	-	-	2
10.0.5.0	0.0.0.0	255.255.255.0	U	1	-	-	3

3. Node C

```
Node: 4, Time: +29.0s, Local time: +29.0s, Ipv4ListRouting table
Priority: 0 Protocol: ns3::Rip
Node: 4, Time: +29.0s, Local time: +29.0s, IPv4 RIP table
```

Destination	Gateway	Genmask	Flags	Metric	Ref	Use	Iface
10.0.6.0	10.0.3.1	255.255.255.0	UGS	3	-	-	2
10.0.5.0	10.0.3.1	255.255.255.0	UGS	2	-	-	2
10.0.1.0	10.0.2.1	255.255.255.0	UGS	2	-	-	1
10.0.0.0	10.0.2.1	255.255.255.0	UGS	2	-	-	1
10.0.2.0	0.0.0.0	255.255.255.0	U	1	-	-	1
10.0.3.0	0.0.0.0	255.255.255.0	U	1	-	-	2
10.0.4.0	0.0.0.0	255.255.255.0	U	1	-	-	3

#### 4. Node D

```
Node: 5, Time: +29.0s, Local time: +29.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 5, Time: +29.0s, Local time: +29.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref      Use Iface
10.0.3.0          10.0.5.1     255.255.255.0 UGS    2      -      -    2
10.0.2.0          10.0.5.1     255.255.255.0 UGS    3      -      -    2
10.0.0.0          10.0.5.1     255.255.255.0 UGS    3      -      -    2
10.0.1.0          10.0.5.1     255.255.255.0 UGS    2      -      -    2
10.0.4.0          0.0.0.0      255.255.255.0 U       1      -      -    1
10.0.5.0          0.0.0.0      255.255.255.0 U       1      -      -    2
10.0.6.0          0.0.0.0      255.255.255.0 U       1      -      -    3
```

T = 79secs

#### 1. Node A

```
Node: 2, Time: +79.0s, Local time: +79.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 2, Time: +79.0s, Local time: +79.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref      Use Iface
10.0.4.0          10.0.1.2     255.255.255.0 UGS    16     -      -    2
10.0.3.0          10.0.2.2     255.255.255.0 UGS    2      -      -    3
10.0.0.0          0.0.0.0      255.255.255.0 U       1      -      -    1
10.0.1.0          0.0.0.0      255.255.255.0 U       1      -      -    2
10.0.2.0          0.0.0.0      255.255.255.0 U       1      -      -    3
```

#### 2. Node B

```
Node: 3, Time: +79.0s, Local time: +79.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 3, Time: +79.0s, Local time: +79.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref      Use Iface
10.0.6.0          10.0.1.1     255.255.255.0 UGS    16     -      -    1
10.0.4.0          10.0.1.1     255.255.255.0 UGS    16     -      -    1
10.0.2.0          10.0.1.1     255.255.255.0 UGS    2      -      -    1
10.0.0.0          10.0.1.1     255.255.255.0 UGS    2      -      -    1
10.0.1.0          0.0.0.0      255.255.255.0 U       1      -      -    1
10.0.3.0          0.0.0.0      255.255.255.0 U       1      -      -    2
10.0.5.0          10.0.1.1     255.255.255.0 UGS    16     -      -    1
```

#### 3. Node C

```
Node: 4, Time: +79.0s, Local time: +79.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 4, Time: +79.0s, Local time: +79.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref      Use Iface
10.0.1.0          10.0.2.1     255.255.255.0 UGS    2      -      -    1
10.0.0.0          10.0.2.1     255.255.255.0 UGS    2      -      -    1
10.0.2.0          0.0.0.0      255.255.255.0 U       1      -      -    1
10.0.3.0          0.0.0.0      255.255.255.0 U       1      -      -    2
10.0.4.0          10.0.2.1     255.255.255.0 UGS    16     -      -    1
```

#### 4. Node D

```
Node: 5, Time: +79.0s, Local time: +79.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 5, Time: +79.0s, Local time: +79.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref      Use Iface
10.0.6.0          0.0.0.0      255.255.255.0  U        1      -        -    3
```

T = 149secs

#### 1. Node A

```
Node: 2, Time: +149.0s, Local time: +149.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 2, Time: +149.0s, Local time: +149.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref      Use Iface
10.0.6.0          10.0.2.2      255.255.255.0  UGS      12      -        -    3
10.0.4.0          10.0.2.2      255.255.255.0  UGS       2      -        -    3
10.0.3.0          10.0.2.2      255.255.255.0  UGS       2      -        -    3
10.0.0.0          0.0.0.0      255.255.255.0  U         1      -        -    1
10.0.1.0          0.0.0.0      255.255.255.0  U         1      -        -    2
10.0.2.0          0.0.0.0      255.255.255.0  U         1      -        -    3
```

#### 2. Node B

```
Node: 3, Time: +149.0s, Local time: +149.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 3, Time: +149.0s, Local time: +149.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref      Use Iface
10.0.6.0          10.0.3.2      255.255.255.0  UGS      12      -        -    2
10.0.4.0          10.0.3.2      255.255.255.0  UGS       2      -        -    2
10.0.2.0          10.0.1.1      255.255.255.0  UGS       2      -        -    1
10.0.0.0          10.0.1.1      255.255.255.0  UGS       2      -        -    1
10.0.1.0          0.0.0.0      255.255.255.0  U         1      -        -    1
10.0.3.0          0.0.0.0      255.255.255.0  U         1      -        -    2
10.0.5.0          10.0.1.1      255.255.255.0  UGS      16      -        -    1
```

#### 3. Node C

```
Node: 4, Time: +149.0s, Local time: +149.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 4, Time: +149.0s, Local time: +149.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref      Use Iface
10.0.6.0          10.0.4.2      255.255.255.0  UGS      11      -        -    3
10.0.1.0          10.0.2.1      255.255.255.0  UGS       2      -        -    1
10.0.0.0          10.0.2.1      255.255.255.0  UGS       2      -        -    1
10.0.2.0          0.0.0.0      255.255.255.0  U         1      -        -    1
10.0.3.0          0.0.0.0      255.255.255.0  U         1      -        -    2
10.0.4.0          10.0.2.1      255.255.255.0  UGS      16      -        -    1
10.0.4.0          0.0.0.0      255.255.255.0  U         1      -        -    3
```

#### 4. Node D

```
Node: 5, Time: +149.0s, Local time: +149.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 5, Time: +149.0s, Local time: +149.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref    Use Iface
10.0.3.0         10.0.4.1     255.255.255.0 UGS    11    -    -    1
10.0.2.0         10.0.4.1     255.255.255.0 UGS    11    -    -    1
10.0.0.0         10.0.4.1     255.255.255.0 UGS    12    -    -    1
10.0.1.0         10.0.4.1     255.255.255.0 UGS    12    -    -    1
10.0.5.0         10.0.4.1     255.255.255.0 UGS    16    -    -    1
10.0.6.0         0.0.0.0      255.255.255.0 U       1     -    -    3
10.0.4.0         0.0.0.0      255.255.255.0 U       1     -    -    1
```

T = 280secs

#### 1. Node A

```
Node: 2, Time: +280.0s, Local time: +280.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 2, Time: +280.0s, Local time: +280.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref    Use Iface
10.0.5.0         10.0.1.2     255.255.255.0 UGS     2     -    -    2
10.0.6.0         10.0.1.2     255.255.255.0 UGS     3     -    -    2
10.0.4.0         10.0.2.2     255.255.255.0 UGS     2     -    -    3
10.0.3.0         10.0.2.2     255.255.255.0 UGS     2     -    -    3
10.0.0.0         0.0.0.0      255.255.255.0 U       1     -    -    1
10.0.1.0         0.0.0.0      255.255.255.0 U       1     -    -    2
10.0.2.0         0.0.0.0      255.255.255.0 U       1     -    -    3
```

#### 2. Node B

```
Node: 3, Time: +280.0s, Local time: +280.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 3, Time: +280.0s, Local time: +280.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref    Use Iface
10.0.6.0         10.0.5.2     255.255.255.0 UGS     2     -    -    3
10.0.4.0         10.0.3.2     255.255.255.0 UGS     2     -    -    2
10.0.2.0         10.0.1.1     255.255.255.0 UGS     2     -    -    1
10.0.0.0         10.0.1.1     255.255.255.0 UGS     2     -    -    1
10.0.1.0         0.0.0.0      255.255.255.0 U       1     -    -    1
10.0.3.0         0.0.0.0      255.255.255.0 U       1     -    -    2
10.0.5.0         10.0.1.1     255.255.255.0 UGS    16     -    -    1
10.0.5.0         0.0.0.0      255.255.255.0 U       1     -    -    3
```

### 3. Node C

```
Node: 4, Time: +280.0s, Local time: +280.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 4, Time: +280.0s, Local time: +280.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref    Use Iface
10.0.6.0         10.0.3.1     255.255.255.0 UGS      3      -      -    2
10.0.5.0         10.0.3.1     255.255.255.0 UGS      2      -      -    2
10.0.1.0         10.0.2.1     255.255.255.0 UGS      2      -      -    1
10.0.0.0         10.0.2.1     255.255.255.0 UGS      2      -      -    1
10.0.2.0         0.0.0.0      255.255.255.0 U        1      -      -    1
10.0.3.0         0.0.0.0      255.255.255.0 U        1      -      -    2
10.0.4.0         10.0.2.1     255.255.255.0 UGS     16      -      -    1
10.0.4.0         0.0.0.0      255.255.255.0 U        1      -      -    3
```

### 4. Node D

```
Node: 5, Time: +280.0s, Local time: +280.0s, Ipv4ListRouting table
  Priority: 0 Protocol: ns3::Rip
Node: 5, Time: +280.0s, Local time: +280.0s, IPv4 RIP table
Destination      Gateway      Genmask      Flags Metric Ref    Use Iface
10.0.3.0         10.0.5.1     255.255.255.0 UGS      2      -      -    2
10.0.2.0         10.0.5.1     255.255.255.0 UGS      3      -      -    2
10.0.0.0         10.0.5.1     255.255.255.0 UGS      3      -      -    2
10.0.1.0         10.0.5.1     255.255.255.0 UGS      2      -      -    2
10.0.5.0         10.0.4.1     255.255.255.0 UGS     12      -      -    1
10.0.6.0         0.0.0.0      255.255.255.0 U        1      -      -    3
10.0.4.0         0.0.0.0      255.255.255.0 U        1      -      -    1
10.0.5.0         0.0.0.0      255.255.255.0 U        1      -      -    2
```

Q2 At  $t = 79$ secs the destination becomes unreachable as both the links to D had been broken at  $t = 30$ secs. At  $t = 149$ secs, the destination again becomes reachable due to link C-D which comes back at  $t = 80$ secs but the cost metric is high. At  $t = 280$ secs, all the links are back up and the situation is similar to  $t = 29$ secs.

All the tables have converged at  $t = 280$ secs and  $t = 29$ secs. Whereas destination is not reachable at  $t = 79$ secs while it is at  $t = 29$ secs. Also at  $t = 29$ secs, metric is less than  $t = 149$ secs for reaching all the nodes.

Command to run code –

`./waf --run scratch/2019PH10629_partb`