CSE 3152 – COMPUTER NETWORKS

InSem 2 Examination – SCHEME

lType: MCQ

Q1. Which one of the following is not a function of network layer? (0.5)

1. Routing
2. **Error control
3. Inter-networking
4. Intra AS Routing

Q2. During error reporting, ICMP always reports error messages to _________ (0.5)

1. Destination
2. Next Router
3. **Source
4. Previous Router

Q3. ----fields in an IPv4 packet are used by the receiver to reassemble associated fragments. (0.5)

1. The IP identification field to identify all associated fragments, the More Fragment bit to indicate whether or not more fragments follow the current one, and the Time to Live to expire missing fragments.
2. The IP identification field to identify all associated fragments, the More Fragment bit to indicate whether or not more fragments follow the current one, and the TCP checksum to discard corrupted segments.
3. ** The IP identification field to identify all associated fragments, the More Fragment bit to indicate whether or not more fragments follow the current one, and the fragment offset to indicate where a particular fragment falls in relation to other fragments.
4. The IP identification field to identify all associated fragments, the More Fragment bit to indicate whether or not more fragments follow the current one,the IP options to route all fragments through the same intermediate routers.

Q4. Count-to-Infinity problem occurs in .... (0.5)

1. Link state routing
2. **Distance vector routing
3. Hierarchical routing
4. None of the above.

Q5. RIP is based on ------------- algorithm that uses ----- as cost metric. (0.5)

1. ** Distance-Vector , hop count
2. Dijkstra's shortest path, hop count.
3. Link state, hop count
4. Distance-Vector , Propagation delay.

Q6. A new SampleRTT is calculated for _____________. (0.5)

1. retransmitted segment
2. ** transmitted but currently unacknowledged segment
3. transmitted and currently acknowledged segment
4. none of these

The full form of EWMA estimator that is used in *TCP* RTT computations is __________.(0.5)

1. ** exponential weighted moving average
2. exponential weighted mass average
3. exponential weighted mean average
4. exponential weighted measure average

Q8. _________ overcomes the problem with timeout-triggered retransmissions or relatively long timeout period. (0.5)

1. doubling timeout interval
2. calculating sampleRTT for every segment
3. use of cumulative acknowledgement
4. ** fast retransmission

Q9. _______ is not the client side TCP state. (0.5)

1. FIN_WAIT_2
2. SYN_SENT
3. ** LAST_ACK
4. TIMED_WAIT

Q10. Suppose a TCP connection is transferring a file of 1000 bytes. The first byte is numbered 10001. What is the sequence number of the segment if all data is sent in only one segment? (0.5)

1. 10000
2. ** 10001
3. 100001
4. 1000

Type: DES

Q11. Consider sending a 2400-byte datagram into a link that has an MTU of 700 bytes. Suppose the original datagram is stamped with the identification number 422. How many fragments are generated? Calculate the values in the Offset, Flag fields in the IP datagram for all the fragments (2)

Ans: Fragments:1M + Offset:0.5M + Flags:0.5M →Total 2 Marks.

The maximum size of data field in each fragment = 680 (because there are 20 bytes IP header). Thus the number of required fragments is 4. i.e.(2400-20 /680) =4
Each fragment will have Identification number 422. Each fragment except the last one will be of size 700 bytes (including IP header). The last datagram will be of size 360 bytes (including IP header). The offsets of the 4 fragments will be 0, 85, 170, 255. Each of the first 3 fragments will have flag=1; the last fragment will have flag=0.

Q12. How TCP slow start congestion control mechanism updates ssthresh and cwnd values during timeout and new acknowledgment segment? (2)

Ans: For timeout (1M)+ for new Ack (1M)

- Whenever there is a timeout during slow start, following update happens
  ssthresh=cwnd/2
  cwnd=1 MSS

- Whenever a new acknowledgment segment is received during slow start, following update happens
  cwnd=cwnd+MSS

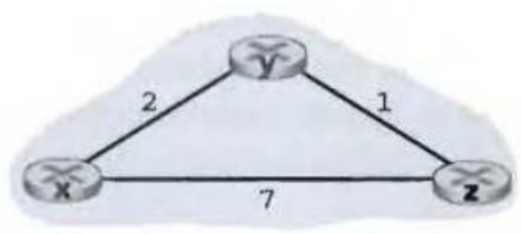
Q13. Consider a router that interconnects three subnets: Subnet 1, Subnet 2, and Subnet 3. Suppose all of the interfaces in each of these three subnets are required to have the prefix **223.1.17/24**. Also suppose that Subnet 1 is required to support at least 60 interfaces, Subnet 2 is to support at least 90 interfaces, and Subnet 3 is to support at least 12 interfaces. Provide three network addresses (of the form a.b.c.d/x) that satisfy these constraints.

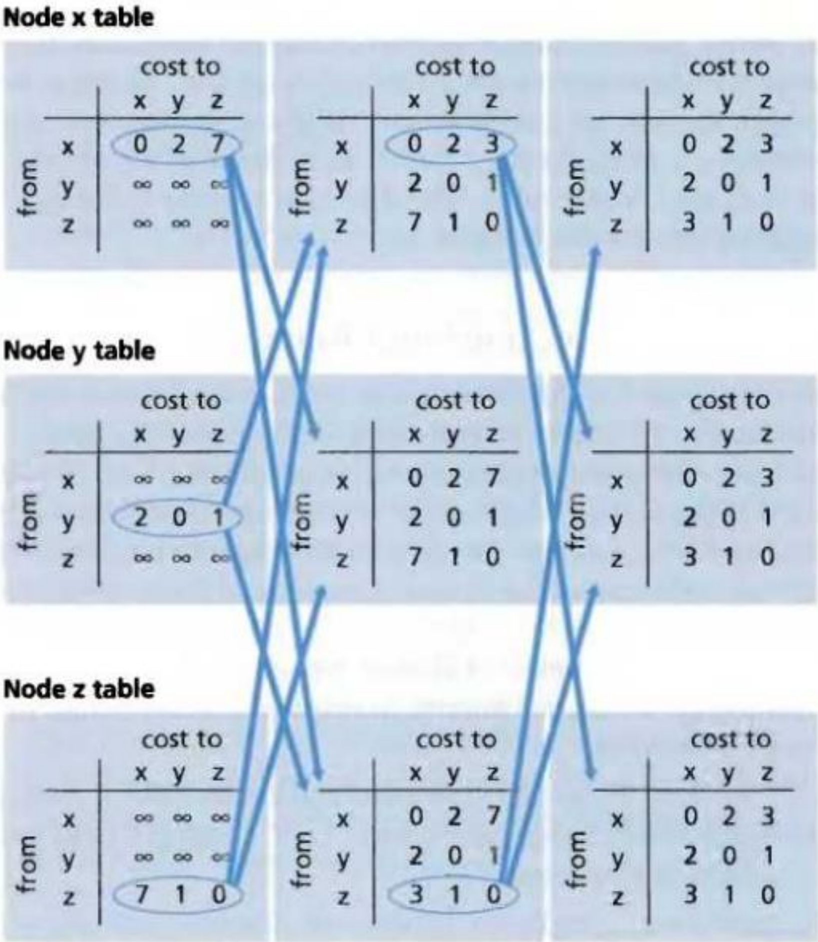
Ans: Each subnet address in prefix notation:1M *3 → 3M

223.1.17.0/26
223.1.17.128/25
223.1.17.192/28

Q14. Assuming that all nodes simultaneously receive distance vectors from their neighbours, illustrate the operation of the Distance Vector algorithm for the following three node network with all the routing table entries. (3)

Ans: For each routing table entry (1M)




Node x table
cost to
x y z
from
x 0 2 7
y ∞ ∞ ∞
z ∞ ∞ ∞
cost to
x y z
from
x 0 2 3
y 2 0 1
z 7 1 0
cost to
x y z
from
x 0 2 3
y 2 0 1
z 3 1 0
Node y table
cost to
x y z
from
x ∞ ∞ ∞
y 2 0 1
z ∞ ∞ ∞
cost to
x y z
from
x 0 2 7
y 2 0 1
z 7 1 0
cost to
x y z
from
x 0 2 3
y 2 0 1
z 3 1 0
Node z table
cost to
x y z
from
x ∞ ∞ ∞
y ∞ ∞ ∞
z 7 1 0
cost to
x y z
from
x 0 2 7
y 2 0 1
z 3 1 0
cost to
x y z
from
x 0 2 3
y 2 0 1
z 3 1 0

****