Assignment 4

The due date for submitting this assignment has passed. You have not submitted this assignment. Due on 2020-10-14, 23:59 IST.

1. Consider the following statements about the multi-layer network concept. 

   a. The multi-layer network can be modeled using a single graph.

   b. A simple graph represents the single-layer network.

   c. If a multi-layer DHT network represented by set of layers to which a node is member. The required number of multi-levels need not be equal to number of nodes.

   d. A node which is not part of a layer, can be a leaf node for the DHT network represented by the set of layers.

   Which of the above statements are NOT true? Select the correct code.

     a. 1
     b. 2
     c. 3
     d. 4

     No, the answer is incorrect.

     Score: 3

2. Consider the following statements about the root node.

   a. For any object, there will be unique responsible node called as root node.

   b. The root node stores the data in the flat hierarchy.

   c. Tapestry is decentralized and the root node for an object can be the current node itself, even if it doesn’t have a better matching node can be found to whom the entry can be forwarded.

   d. It Kademlia, a root node for an object is chosen to be the one with hash value that shares the most prefix digits with the object’s hash value.

   Which of the above statements are NOT true? Select the correct code.

     a. 1
     b. 2
     c. 3
     d. 4

     No, the answer is incorrect.

     Score: 3

3. Suppose a Tapestry network contains only the nodes 6073, 7601, 7195, and 7048. The root node for an object with a hash 123456789 is

   a. 7048
   b. 7601
   c. 7195
   d. None of the above

   No, the answer is incorrect.

   Score: 3

4. Consider the following statements about the routing table of the Tapestry.

   a. In order to allow nodes to locate objects stored at other nodes, each node maintains a routing table.

   b. For creating the routing table, a node creates a partition in node’s space at highest level and maintains a 1-entries, one from each sub-partition.

   c. At next level, the current partition of the node is further partitioned in sub-partitions and node maintains 1 node (D0), one from each sub-partitions. This is followed in the smallest sub-partition has N nodes only.

   d. Each entry of the routing table consists of several entries, and for each unique digit at that level.

   Which of the above statements are NOT correct? Select the correct code.

     a. 1
     b. 2
     c. 3
     d. 4

     No, the answer is incorrect.

     Score: 3

5. Failures can occur due to sensor failures (those due to hard- and software failures), link failures (under faulty, hardware and software link faults), network table corruption at the server, and failures of intermediate nodes. Consider the following statements about possible modifications in Tapestry to make it fail-tolerant.

   a. Each entry in the routing table is a key-value pair (where the key is a neighbor ID and the value is the corresponding neighbor). The key is the primary key.

   b. The primary key fails, the backup fails, and a data front-end port no longer receives incoming messages from failed neighbors.

   c. If the primary is replaced, then it is re-initialized.

   d. If the failed node is not repaired within a timeout interval, then the next successor is made primary.

   Which of the above statements are correct? Select the correct code.

     a. 1
     b. 2
     c. 3
     d. 4

     All of the above

     No, the answer is incorrect.

     Score: 3

6. Consider the find-node algorithm in Tapestry. The steps are given as follows:

   a. 1. Compute (Hash(Object ID) - Hash ID).

   b. 2. If most significant 1-digits are matching with current node ID, go to routing table’s left column. In 4th column, find the node, which has 4th digit greater than or equal to 4th digit of ID.

   c. 3. If the found node is not the current node, then forward the query to find node.

   d. 4. If the found node is current node, then no node found.

   Which of the steps are NOT correct? Select the correct code.

     a. 1
     b. 2
     c. 3
     d. 4

     No, the answer is incorrect.

     Score: 3

7. Consider the following statements about Multi-layered networks.

   a. Multi-layered networks consist of layers of several networks, where nodes appear in at least one of these layers.

   b. The networks are both connected by intra-layer links (links in one layer) as well as inter-layer links (links between layers) which is not an actual link but a common node across the layers.

   c. In real communication networks, such as peer-to-peer network, one can draw a logical network (the connectedness of peers with each other) as well as a physical network (the way peers are connected through cables, hubs and data centers).

   d. Single layer networks are mostly a simplification of the real world. Each network layer has nodes which are related by some common property to each other.

   Which of the above statements are correct? Select the correct code.

     a. 1
     b. 2
     c. 3
     d. 4

     All of the above

     No, the answer is incorrect.

     Score: 3

8. Consider the following statements about Multi-layered networks.

   a. Multi-layered networks consist of layers of several networks, where nodes appear in at least one of these layers.

   b. The networks are both connected by intra-layer links (links in one layer) as well as inter-layer links (links between layers) which is not an actual link but a common node across the layers.

   c. In real communication networks, such as peer-to-peer network, one can draw a logical network (the connectedness of peers with each other) as well as a physical network (the way peers are connected through cables, hubs and data centers).

   d. Single layer networks are mostly a simplification of the real world. Each network layer has nodes which are related by some common property to each other.

   Which of the above statements are correct? Select the correct code.

     a. 1
     b. 2
     c. 3
     d. 4

     All of the above

     No, the answer is incorrect.

     Score: 3