Quiz Submissions - Test 1

Deepank Kartikey (username: DKART060)

Attempt 1

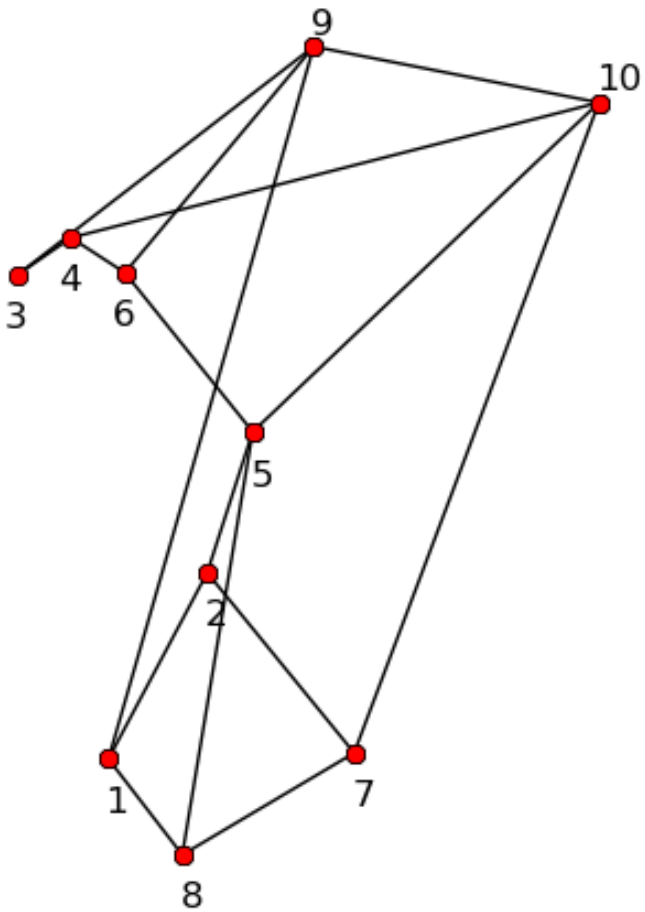
Written: Oct 6, 2021 7:30 PM - Oct 6, 2021 9:00 PM

Submission View

Your quiz has been submitted successfully.

Question 1 **5 / 6 points**

Consider the following network topology. Simply list the edges that you believe are NOT in the GG.



- (1,9)

- (4,9)
- (4,10)
- (5,8)
- (5,10)
- (7,10)

The correct answer is not displayed for Written Response type questions.

Hide Feedback

{(1,9), (4,9), (4,10), (5,8), (7,10)}

Question 2 **2 / 2 points**

Which of the following two statements are true?

- ✔ The choice of transmission power has no impact on the contention for the medium.
- ✔ The choice of too large transmission power may result in excessive interference.
- ✔ The choice of too small power level may result in a disconnected network.
- ✔ Collisions cannot be mitigated by choosing the smallest transmission power subject to maintaining network connectivity.

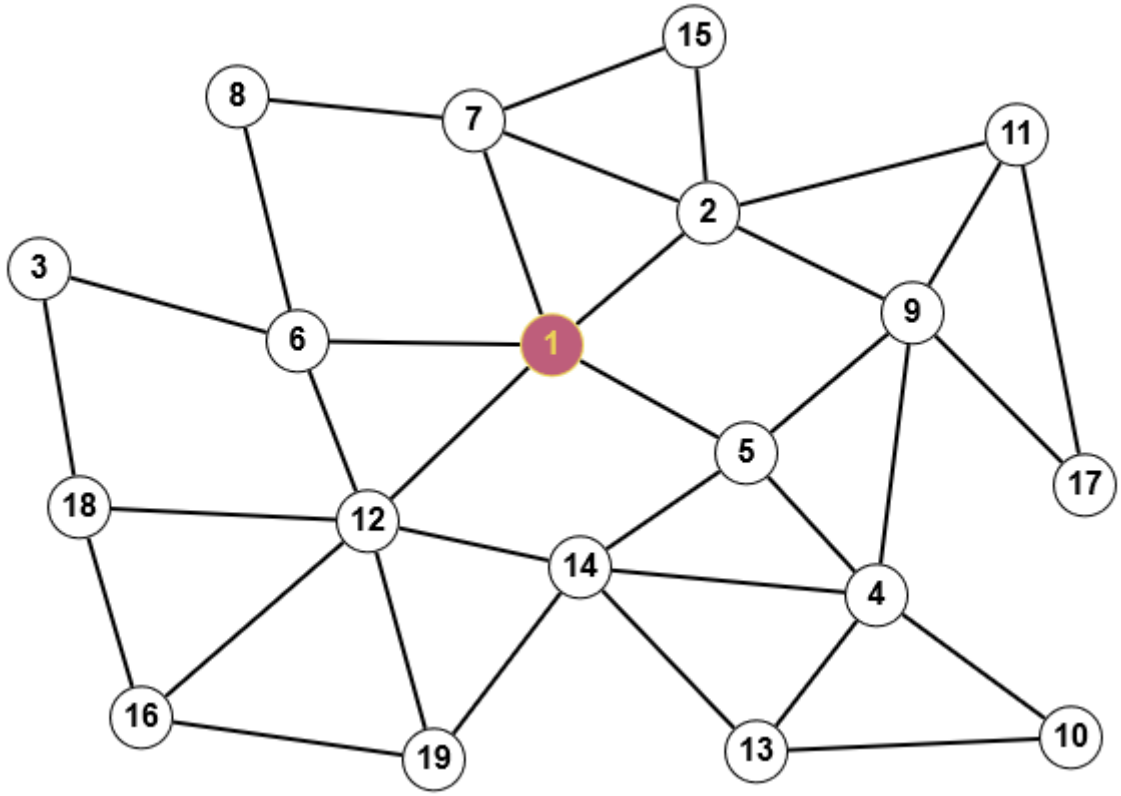
Question 3 **2 / 2 points**

Which of the two following statements are true?

- ✔ The exposed terminal problem has no impact on the bandwidth utilization.
- ✔ RTS/CTS mechanism can be used to solve hidden terminal problem.
- ✔ In ad hoc networks, the power management has no impact on the channel utilization.
- ✔ The SIFS (Short Inter-Frame Space) parameter defines how long a receiving station has to wait before sending an ACK or other response.

Question 4 **4 / 4 points**

Find the MPR set for the highlighted node in the following network topology.



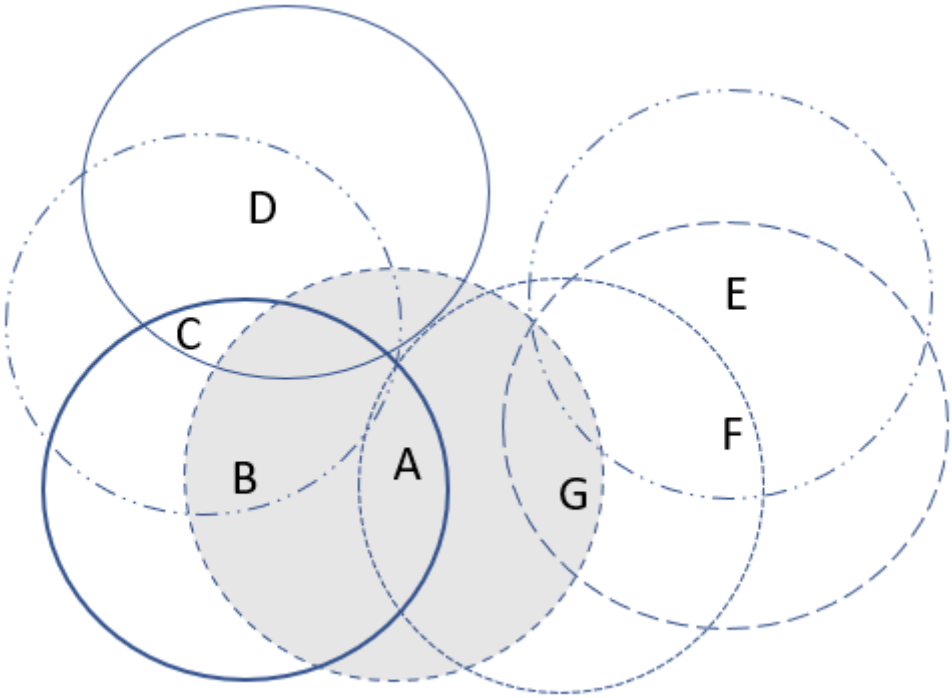
MPR set = {12, 2, 5, 6}

The correct answer is not displayed for Written Response type questions.

Question 5 — 4 / 4 points

Consider the wireless network topology below. Assuming that losses only occur due to collisions, answer the following questions:

1. When node A transmits to node B, list the potential hidden terminal from A and exposed terminals. List the nodes that will be considered "hidden terminals" and "exposed terminals".
2. What about when node B transmits to node C? List the nodes that will be considered "hidden terminals" and "exposed terminals".



1. A transmits to B
    - Hidden Terminals: C
    - Exposed Terminals: G
2. B transmits to C
    - Hidden Terminals: D
    - Exposed Terminals: A

The correct answer is not displayed for Written Response type questions.

Question 6 **2 / 2 points**

List two benefits of Scatternet over Piconet. **(2 marks)**

1. Scatternet supports more than 8 nodes. (Piconet supports at max 8 nodes due to limited 3-bit address space).
2. Scatternet has a larger coverage area when compared to piconet's coverage area.

The correct answer is not displayed for Written Response type questions.

Question 7 **2 / 2 points**

Which of the following two statements are false?

✔ ☐ LEACH uses randomized rotation of cluster heads in the network, and the data compression is performed at the cluster head.

✔ ☐ In LEACH, once a node has been elected as a cluster head it can also become a cluster head in the next round.

- [x] In HEED, the size of a cluster is independent of how far away it is from the base station.

- [x] LEACH produces clusters of equal size and the residual energy of nodes and intra-cluster communication cost play a significant part in the cluster head selection.

Question 8 **1 / 2 points**

You are asked to choose between AODV and OLSR. Name (and discuss) two factors that will influence your decision in favor of AODV. **(2 marks)**

1. AODV uses sequence numbers to denote "Freshness of the route". Hence, it is easy to keep up-to-date with the route.
2. AODV manages "Local Connectivity" efficiently. The nodes learn from their neighbors by exchanging *hello messages* and keep node lifetime(s) up-to-date.

The correct answer is not displayed for Written Response type questions.

▼ Hide Feedback

Both of your reasons look same to me.

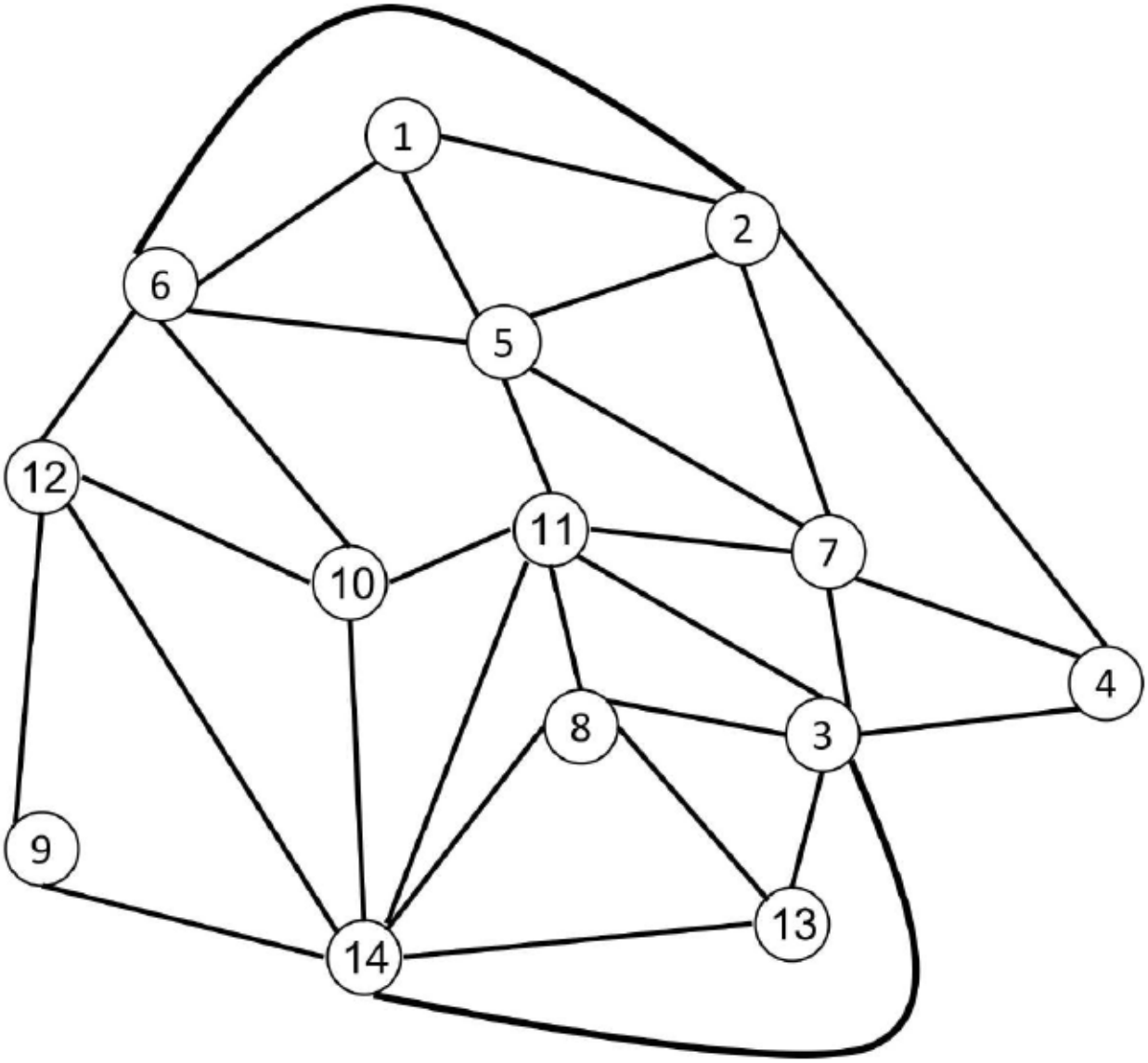
When will you choose one over the other?

Low node mobility: control overhead in AODV is related to route discovery, which is initiated when a path break occurs. In networks with low mobility, path breaks occurs less frequently, making AODV perform well.

Cost of network overhead/network performance: OLSR maintains an up-to-date routing table at all times, thus, a decrease in network performance is likely as more network overhead is needed.

Question 9 **0 / 6 points**

Apply the generalized covering rule to determine which nodes do not belong to the connected dominating set. For each such node, list the neighbors that cover it. Node A is covered by neighboring nodes B, C, ... if B, C, ... are connected (that is, create connected subgraph), any neighbor of A is neighbor of (at least) one of B, C,.. and key(A) < min (key(B), key(C),...). Use key = ID, ordered numerically (1<2<3<...). Node A is also considered covered if it does not have two unconnected neighbors.



- No text entered -

The correct answer is not displayed for Written Response type questions.

Hide Feedback

Non-intermediate node: 1, 9, 13

Covered nodes: 2 (by 5, 6, 7); 3 (by 7, 8, 11); 4 (by 7); 10 (by 11, 12, 14)

CDS nodes: 5, 6, 7, 8, 11, 12, 14

Attempt Score:22 / 30 - B

Overall Grade (highest attempt)**:**22 / 30 - B

Done