Lecture Section:

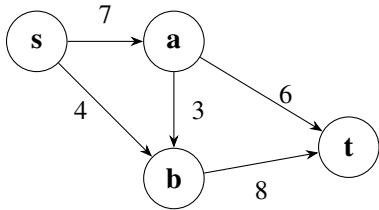**Monday, Oct 20, 2025**

Student Name:

PSU Email ID:

1. (2 pts.)   Using Ford-Fulkerson, what is the value of a maximum flow in the following flow network?

- (a) 9
- (b) 10
- (c) 11
- (d) 12

2. (2 pts.)   In the network of question 1, what is the minimum cut with respect to the maximum flow you found?

- (a) $(\{s,a,b\},\{t\})$
- (b) $(\{s,a\},\{b,t\})$
- (c) $(\{s,b\},\{a,t\})$
- (d) $(\{s\},\{a,b,t\})$
- (e) $(\{s,t\},\{a,b\})$

3. (2 pts.)   If the augmenting $s-t$ paths are found by BFS, then the Ford–Fulkerson algorithm runs in polynomial time with respect to the number of vertices and edges in the graph.

- ○ True
- ○ False

4. (2 pts.)   The Ford–Fulkerson algorithm can be adapted to work correctly when:

- (a) The graph contains cycles.
- (b) Edge capacities are rational numbers.
- (c) There are multiple source nodeds.
- (d) All of the above.

5. (2 pts.)   Every edge (u,v) in a flow network is converted into either a forward edge (u,v) or a backward edge (v,u) in Ford-Fulkerson's residual graph. In other words, (u,v) and (v,u) never exist simultaneously in the residual graph.

- ○ True
- ○ False