BRAC University (Department of Computer Science and Engineering)

CSE 221 (Algorithms) for Summer 2025 Semester

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Quiz 3

Student ID: **Full Marks: 20**
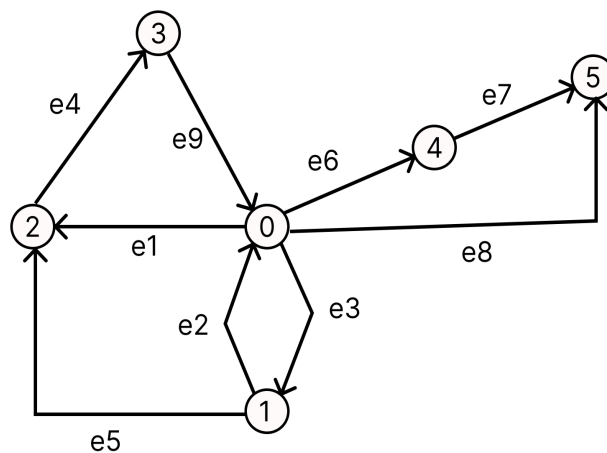**Section:**
Name:
Duration: 25 minutes

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1. Run DFS on the following graph. Write down the set of visited nodes and edges in order of traversal. The **source node** is determined by taking **the last two digits of your Student ID plus 1 modulo 2**. For *Example:* If your Student ID is ******23, then the source node is calculated as: (23+1) % 2 = 0 → Source node is 0.
   During Depth-First Search (DFS), always choose **the next edge based on the smallest edge label. (14)**
      (a) Visited Set **(4)**   (b) Edges Set **(4)**   (c) Edge Classification **(6)**

2. Let's say, we have two nodes u and v in a graph. According to DFS, **v is a descendant node of u**. What are the relationships among startTime[u], endTime[u], startTime[v] and endTime[v]. **(3)**

3. Simulate Dijkstra on the following graph and describe why it produces the wrong shortest distance(s). Take *t* as source node. **(3)**