

Quiz 5
Operating Systems and Networks
IIIT Hyderabad
Time: 30 minutes; Max. Marks: 24

Note: Give a brief and correct answer. **Mention your name and roll number on the answer sheet. Answer the question after writing the FIRST 10 WORDS OF THE QUESTION ALONG WITH THE QUESTION NUMBER in the answer sheet.**

1. An old bridge on a busy highway is too narrow to permit two-way traffic, so one-way traffic is to be implemented on the bridge by alternatively permitting vehicles travelling in opposite direction to use the bridge. The following rules are formulated for use of bridge:

- (a) Any time the bridge is used by vehicle(s) travelling in one direction only.
- (b) If the vehicles are waiting to cross the bridge at both ends, only one vehicle from one end is allowed to cross the bridge before a vehicle from the other end starts crossing the bridge.
- (c) If no vehicles are waiting at one end, then any number of vehicles from the other end are permitted to cross the bridge.

Develop a program (Pseudocode) to synchronize vehicles with semaphores. [12]

2. Compare the deadlock prevention algorithms by preventing circular-wait with the deadlock avoidance algorithm (i.e., the banker's algorithm) with respect to the following: runtime overheads and system throughput [5]

3. Identify whether the following statement is TRUE or FALSE. If the statement is FALSE, correct it and justify the corrected sentence. If the statement is TRUE, justify it. Restrict the justification to a few sentences: "Deadlock prevention protocols improve CPU utilization" [5]