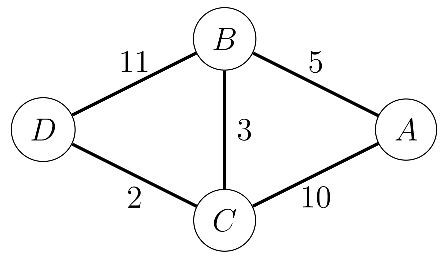
Indian Institute of Technology Bombay
Department of Electrical Engineering

Handout 27 EE 706 Communication Networks
Quiz 10 : **10 points** April 1, 2010

For the network shown below, assume that link state routing is used to build the routing tables. Suppose that node A has received the link state packets from all the other nodes. Detail the steps of Dijkstra's algorithm for calculating the shortest paths at node A by adding the rows to the table given below.



Step	M	$N - M$	Cost to B, Next hop to B	Ct to C, NH to C	Ct to D, NH to D
1	$\{A\}$	$\{B, C, D\}$	5,B	10,C	∞,-

Psuedocode for Dijkstra's algorithm is given below for your convenience. It calculates the shortest paths at a source node S. N is the set of all nodes, $C_S(X)$ is the cost of reaching node X from node S and $l(S, X)$ is the cost of the edge from node S to node X.

$M = \{S\}$
for each X in $N - \{S\}$
  $C_S(X) = l(S, X)$
  if $C_S(X) < \infty$, next hop for X is X itself
while $(N \neq M)$
  $M = M \cup \{Y\}$ such that $C_S(Y)$ is the minimum among all Y in $(N - M)$
  for each X in $(N - M)$
    $C_S(X) = \min\{C_S(X), C_S(Y) + l(Y, X)\}$
    if $C_S(X)$ has changed, next hop for X is the next hop to reach Y from S