King Fahd University of Petroleum and Minerals
Computer Engineering Department

COE 560: Computer Networks
Spring 2002 (012)

Final Exam

Date: May 22,2002 **Time:** 24hrs **Section:** 1

Instructor: Dr. Abdulaziz Almulhem

Student ID#: **Student Name:**

Question	Points
1.	/15
2.	/15
Total	/30

Notes:

1. Think before you start solving the questions.
2. Solve all the questions.
3. Show all your work.
4. Without proper justification and details of steps, correct answers alone may not carry full credit.

Q.1 Sliding Window Protocols and Routing (15)

Sliding Window Protocols (SWP) are implemented to regulate the flow of traffic of a unicast communication over a network. If a link fails and parts of the traffic are lost, SWP cuts down its window size after detecting the loss. The routing algorithm, in turn, will seek another path to forward the data on. After using the new route with maximum permissible utilization, describe the behavior of SWP when the old route becomes available.

Q.2 **Routing (15)**

Dijkstra's Algorithm that is listed below, has been discussed to give the optimal routing for unicast communication. Modify the algorithm for multicast routing and find its complexity.

Dijkstra's Algorithm

1. Initialization: $N=\{s\}$
   $D_j = C_{sj} \ \forall j \neq s$
   $D_s = \phi$
2. Finding the next closest node:
   Find node $i \notin N$ ∋
   i. $Di = \min_{j \notin N} D_j$
   ii. Add i to N
   iii. If N contains all nodes, stop.
3. Updating minimum cost:
   for each node $j \notin n$
   $D_j = min\{D_j, D_j+C_{ij}\}$

   Goto 2.

End of Exam