1a. What is the difference between the advertised window and the congestion
    window in TCP?
 b. Explain the Fair Queuing mechanism for congestion control at a router. What
    are the advantages and disadvantages of this scheme?
 c. Explain the differences between slow start, fast retransmit and fast recovery
    in TCP.

2a. Explain RED.
 b. Discuss the parameters and the normal parameter settings initially suggested
    by Sally Floyd.
 c. What were the significant conclusions of the "RED Tuning" paper?

3a. Describe and explain CSFQ, AVQ and XCP.
 b. Explain the difference between the efficiently and fairness controllers in XCP.
 c. Discuss three performance measures that can be used to compare these
    three congestion control strategies.
 d. Discuss the advantages and disadvantages of these mechanisms with
    respect to handling Web traffic, UDP traffic, and traffic with specific Quality of
    Service requirements.

4a. Explain why drop tail routers are unfair to Mice as compared to Elephants.
 b. Explain the RIO-PS scheme.
 c. Discuss the key strategy proposed in the "Mice and Elephants" paper.
 d. How does this improve performance?
 e. In what circumstances could the proposed strategy not improve performance?

5a. What does it mean for a flow to be TCP-Friendly, and why is this important in
    the Internet today?
 b. Explain the concept of unresponsive flows.
 c. Explain two forms of congestion collapse.
 d. What techniques can be used to determine disproportionate bandwidths?

6a. Discuss the assumptions of Firoiu and Borden in their model of the n-flow
    feedback system for a network of TCP flows.
 b. Explain how the queue function G(p) and the control function H(q) are used
    to establish an equilibrium point for RED.
 c. Are the recommendations for configuring the RED control function practical?
    Explain why or why not.

7a. Explain the processes involved when a Mobile Host [MH] switches cells.
 b. Discuss the differences in throughput that depends on whether a MH is
    moving between overlapping or non-overlapping cells.
 c. Explain the concept of triggering a fast retransmit upon a cell crossing.

8a. Explain how TCP Westwood differ from TCP Reno.
 b. How does TCPW achieve better utilization for wireless links?
 c. Compare TCPW and TCP Reno in terms of friendliness and fairness.

9a. Explain the principle by which Biaz and Vaidya propose to distinguish
    between a congestion loss and a wireless loss.
 b. How does the ratio of wired link bandwidth to wireless link bandwidth affect
    the identification of the losses?
 c. How does the bandwidth-delay product affect the performance improvement
    of the TCP-Aware strategy?

10a. Explain briefly the difference between Dynamic Source Routing (DSR) and
     Destination-Sequenced Distance Vector (DSDV) used in wireless ad-hoc
     networking.
  b. Describe the three metrics used to measure the routing protocols and how
     each of these measurements relate to ad-hoc networking.
  c. Discuss the impact of routing overhead on TORA and AODV.

11a. What are the key results of the paper by Fu et al?
   b. Explain the distributed LRED algorithm.
   c. Explain the advantages of Adaptive Pacing.

12a. What are the important resource issues for proxy-based TCP-friendly
     streaming to work effectively over mobile networks?
   b. What performance improvements are possible with a proxy-based system?
   c. Why are streaming media fluctuations important to the design of the proxy-
      based system?

13a. Describe how firewalls and intrusion detection systems operate.
   b. What are the advantages and disadvantages of detection of DOS
      beyond the perimeter ?
   c. Explain how direct and reflector DDoS attacks work.
   d. Briefly discuss the Distributed Attack Detection Approach.

14a. What are the various components of the secure overlay solution ?
   b. How does it provide more protection than the traditional methods of
      network security?
   c. What overhead is there in the overlay approach.

15a. Why would you want to extend Kerberos to use Public Key Encryption?
   b. How does the choice of public or private key encryption affect performance?
   c. What are differences between PKINIT and PKCROSS?

16a. Describe some network protocols/events that make traceback of a single IP
     packet complicated.

b. Briefly describe the three parts of the SPIE architecture and how they fit into an ISP network

c. Why is only a packet digest stored and not the entire packet header?

17a. What is distributed priority scheduling and multi-hop co-ordination for ad-hoc wireless networks?

b. Discuss the simulation topology used in this paper. Suggest two alternate topologies that would demonstrate the robustness of the proposed algorithms.

c. Discuss whether the assumptions for the probability of collision, p, that are used in the analytic model are realistic.

18a. Explain the principle components of DiffServ.

b. Discuss the main ideas of MPLS.

c. How does the paper propose to merge DiffServ and MPLS?

19a. Describe the difference between a standard firewall and a DTE firewall.

b. How does a non-DTE client communicate with a DTE firewall?

c. Which protocols performed the best under DTE firewalls? Why?

d. Which performed the worst? Why?

20a. What is Aggregate-based Congestion Control?

b. How does it detect congestion?

c. How does it identify responsible aggregates?

d. Discuss the difficulties of implementing pushback.