For the problems in this assignment, you may consult any book or information available on the Web. However, the answers that you give should be based on your own work and understanding of the subject matter.

Problem 1: (25 points):
1. (10 points) Briefly describe the various techniques used in cluster-based web servers for load distribution.
2. (5 points) What is the notion of content-aware request scheduling in cluster-based web servers?
3. (10 points) Explain the difference between TCP-handoff and TCP-splicing. Which of these can be used for content-aware request distribution? Which of these is more scalable?

Problem 2: (15 points) Briefly answer the following questions:
   a) Why separating the name of an entity from its access point address is desirable?
   b) Can a name be associated with multiple access points? If yes, then give example; otherwise, explain your answer.
   c) What are the distinctions between an address and an identifier?

Problem 3 (10 points):
   a) What is a zone in DNS? What is the meaning of the term zone transfer?
   b) In DNS, what kind of nodes store NS records? What is the purpose of these records?

Problem 4: (15 points) Discuss the relative merits and drawbacks of the iterative and recursive look-up methods in the Domain Name System. What is the general guideline in choosing between these two approaches for a DNS query?

Problem 5: (20 points) Briefly identify the important techniques used in the Domain Name System design to make it highly scalable.

Problem 6: (15 points) Briefly describe the mechanisms used in DNS to support reverse lookup to find the DNS name of a host given its IP address in dotted decimal form.