

# **CNT 4700C Computer Networks Fundamentals, Fall 2011**

Instructor: Prof. Ahmed Helmy

Homework 1: Introduction to (& Architecture of) the Internet & Application Layer

Due Date: Oct 4<sup>th</sup>, in class or to the TA during office hours

## Chapter 1: Introduction and Architecture of the Internet

1. R11

2. Mention at least three advantages of packet switched networking over circuit switched networking.

3. R12

4. R15

5. R16

6. R19

7. R24

8. R27

9. P18

10. Hierarchical Internet architecture:

A. Mention at least three advantages of a hierarchical Internet versus a flat Internet architecture.

B. Mention at least two potential disadvantages for a hierarchical architecture.

11. Mention three advantages of protocol layering, and two potential disadvantages.

12. (Extra points) Mention three main design requirements of the Internet and how they influenced its design.

## Chapter 2: Application Layer

13. Application communication paradigms:

A. What are the three main communication paradigms for clients to obtain network service at the application layer?

B. Mention the main advantages and disadvantages of each of the paradigms in part A above.

14. Discuss the meaning of stateful versus stateless protocols, giving examples of each and an example of a stateless by design that was turned stateful in implementation.

15. R4

16. R5

17. R13

18. R15

19. R22

20. R23

21. P7

22. P8

23. (Extra points) DNS security: attacks on DNS

A. Mention at least three possible attacks on DNS.

B. Mention possible responses to reduce the effect of such attacks.