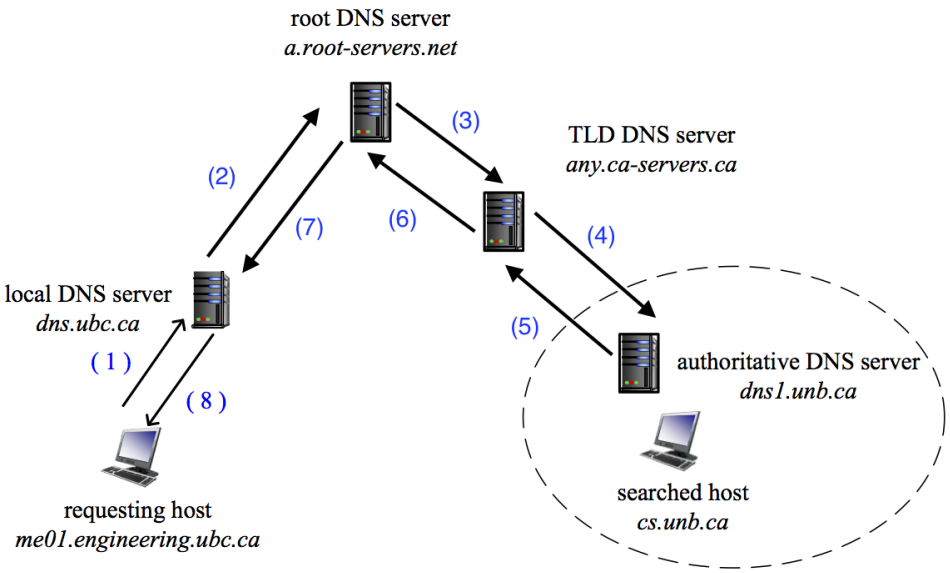
CS3873 – Net Centric Computing
Mid-term Examination
Winter 2019

B

Q1. Multi-Choice Questions (4 points)

C, C, B, C, C, A, C, D

Q2 (3 points)



Note: The recursive approach in the above answer should be distinguished from the iterative approach. Don't confuse these two approaches.

Q3 (3 points)

(a) Is the server supporting persistent or non-persistent HTTP?

Persistent HTTP, because `"Connection: Keep-Alive"`

(b) How many bytes are there in the document being returned?

3874 bytes, because `"Content-Length: 3874"`

(c) When was the document last modified?

Sat, 10 Dec 2005 18:27:46GMT, because `"Last-Modified: Sat, 10 Dec 2005 18:27:46GMT"`

Q4. (3 points)

a) L = 6000 bits R = 20 Gbps = $2*10^{10}$ bits/sec

$$d_{trans} = \frac{L}{R} = \frac{6000}{2 \times 10^{10}} = 3 \times 10^{-7} seconds = 0.3\ \mu s$$

Note: B is used for bytes, while b is used for bits; kbps = 1000 bits/sec; Gbps = 10^9 bits/sec

b) d = 50 km = $5*10^4$ m s = $2*10^8$ m/s

$$d_{prop} = \frac{d}{s} = \frac{5 \times 10^4}{2 \times 10^8} = 2.5 \times 10^{-4}\ seconds = 0.25\ ms$$

Q5. (4 points)

a) P = 500, N = 4, L = 256*8*1000 bits, R = 10 Mbps, d_{trans} = L/R = 256*8*1000 / ($10*10^6$) = 0.2048 s

d_{e2e} = (P-1)*d_{trans} + N*d_{trans} = (500-1)* 0.2048+ 4*0.2048 = 103.01 seconds

OR, approximately, d_{e2e} = P*d_{trans} = 500 * 0.2048 = 102.4 seconds

b) R1 = 5 Mbps, d_{trans} = L/R_1 = 256*8*1000 / ($5*10^6$) = 0.4096 seconds

d_{e2e} = P*d_{trans} = 500 * 0.4096 = 204.8 seconds

Q6. (3 points)

a) 0 1 **0** 0 0 0 0 0 0 1 0 1 0 0 1 1

b) Calculating one's complement sum of the three numbers gives:

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 (error-free)

Or calculate the correct checksum of the first two numbers and compare it with the given checksum.