HW1

10 1.

To calculate time cost in choice b

10TB/1TB * 1TB/500Mpbs * 2 + 1h = 98.73h

so the data rate of disk copy: 10TB/98.73h = 247.47 Mbps > 100Mbps

so the disk copy is faster

10 2.
   a. 57600bps * 0.1s = 5760bit
   b. 1.54Mpbs * 0.005s = 7700bit
   c. 36000km / (3*10^8) * 5Mbps * 2 = 1.2 *10^6 bit

   3.
   a.   (512B/100Mbps + 3us) * 3 = 131.88 us

10 b.   since its a large file, i can use the following method

   (512-50) / 512 * 100 = 90.23 Mbps

c. cost time:

(512B / 100Mbps + 10B / 100Mbps + 2 * 3us) * 3 = 143.28us

so the effective bandwidth:
(512B - 50B) / 143.28us = 25.8 Mpbs

10 4.
   a. 100Mbps / 20Mbps = 5;
   b.

$$P = \binom{10}{n} * \left(\frac{1}{10}\right)^n * \left(\frac{9}{10}\right)^{10-n}$$

   c. $1.47*10^{(-4)} = 1 - \sum_{n=0}^{5} \binom{10}{n} * \left(\frac{1}{10}\right)^n * \left(\frac{9}{10}\right)^{10-n}$

5.
a. 2Gbps * 5us = 10000bit
10 b. 2Mbps * 40ms = 80000bit
c. 20 Mbps * 2 * 50000km/(3*10 ^ 8 m/s) = 6666666.667bit

6.
7 a. $(50\%)^5 = 0.03125$
b. $m = 0.5 * 20 * 1 + 0.5^2 * 20 * 2 + 0.5^3 * 20 * 3 + 0.5^4 * 20 * 4 + 0.5^5 * 20 * 5 + 0.5^6 * 20 * 6 = 37.5$
c. $1 + 0.5 * 2 + 0.5^2 * 3 + 0.5^3 * 4 + 0.5^4 * 5 + 0.5^5 * 6 = 3.75$ ❌
d. m/n = 10

7.

10 symbolics.com

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date： 1985-03-15T05:00:00Z

facebook.com：

Registrant Name: Domain Administrator
Registrant Street: 1601 Willow Road,
Registrant City: Menlo Park
 Registrant State/Province: CA
 Registrant Postal Code: 94025
Registrant Country: US
Creation Date: 29-mar-1997 (1997-03-28T21:00:00-0800)

uiuc.edu

Registrant: University of Illinois at Urbana Champaign
address: 1304 West Springfield Avenue Urbana, IL 61801-2910 UNITED STATES
Domain record activated: 18-Jul-1985

airbnb.com

Registrant Name: Domain Administrator
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Creation Date: 05-aug-2008 (2008-08-05T00:29:00-0700)