Homework 1

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- Fill in the blanks

Hexadecimal	Decimal	Binary
0x7d	125	01111101
0xe6	230	11100110
0xe3	127	11100011
0x16	22	00010110
0x3a	58	00111010
0xaf	175	10101111
0x1	1	00000001
0x2d	45	00101101
0x2e	46	00101110
0x83	131	10000011

2. Calculate the overall MTTF of the following system:

Component	MTTF
RAID System	6 Million hours
Server Board	3 Million hours
Power Supply	500,000 hours
Network Interface Card	8 Million hours
Cooling Fan	400, 000 hours

1/(1/6000000 + 1/3000000 + 1/500000 + 1/8000000 + 1/400000) = 195121.95 MTTF(system)

3. Calculate the MTTF of two redundant disk drives where the MTTF is 1.2 million hours and the MTTR is 20 hours.

(1200000^2/(2*20)) = 36,000,000,000 MTTF(pair)

4. Calculate the effective CPI;

Inst Class	A	B	C
CPI	3	2	4
# Instructions	480	640	320
Proportion	3/9	4/9	2/9

3*(3/9) + 2*(4/9) + 4*(2/9) =

Overall CPI = _____2.7777_____

5. The table below shows execution times (in seconds) of a program on two machines. Calculate which machine is faster, by what factor, and by what percent.

Machine A	Machine B	Which is faster?	By Factor	By Percent (0.1%)
1.307971	1.721145	A	1.316	131.6%
1.22175	2.087343	A	1.710	171.0%
0.500306	2.587857	A	5.173	517.3%
3.710749	2.982973	B	1.244	124.4%
3.90917	3.867584	B	1.011	101.1%

6.Fill in the blanks. For example, 32 bits can address 4Gigabytes of memory. Be sure that your numbers for size of memory are powers of 2, i.e., 32 MB. Do not calculate 2^32

Address bits	Size of Memory
16	64 Kilobytes
20	1 Megabyte
18	256 Kilobytes
23	8 Megabytes
19	512 Kilobytes
21	2 Megabytes
22	4 Megabytes
27	128 Megabytes
43	8 Terabytes
12	4 Kilobytes

7. Order the machines from fastest to slowest:

Machine	Instructions	CPI	Clock (GHz)	Exec Time
A	2000	1.6	4	8*10^-7
B	1200	2.1	1.2	2.1*10^-6
C	1700	2.4	3.4	1.2*10^-6
D	2000	2.1	1.4	3*10^-6

Formula: ExecTime = (Instructions * CPI) / (Clock * 10^9)

___a___ ___c___ ___b___ ____d__

(fastest) (slowest)