Answer to question number 4:

Conversion:-

1sec=10^6µs

1min=$6x10^7$µs

1hour=$3.6x10^9$µs

1day=$8.64x10^{10}$µs

1month=$2.592x10^{12}$µs

1year=$3.1557x10^{13}$µs

1centuary=$3.1557x10^{15}$µs

Calculations for a second (and rest of the calculations for different time are similar) :

n!	N!<=10^6 ,so by hit and trial $n \approx 9$
log(n)	$\log_2(n) \le 10^6 \rightarrow 2^{(\log_2(n))} \le 2^{(10^6)} \rightarrow n \le 2^{(10^6)} \rightarrow n \approx 10^{(3*(10^5))} \approx 10^{(300000)}$ *because* $2^{10} \approx 10^3$
nlog(n)	fsolve(n*log[2](n) - 1000000 = 0); solved for n in Maple
n	N<=10^6, hence $n \approx 10^6$
n^2	N^2<=10^6,hence $n \approx 10^3$
n^3	N^3<=10^6,hence $n \approx 10^2$
2^n	2^n<=10^6 → $n log_2(2) \le 6 \log_2(10)$ → $n \le 6 \log_2(10) \approx 19$
sqrt(n)	$\sqrt{n} \le 10^6 \rightarrow n \le 10^{12} \rightarrow n \approx 10^{12}$

Result:-

f(n)	1sec	1min	1hour	1day	1month	1year	1centuary
log(n)	$\approx 10^{300000}$	$\approx 10^{1080000000}$	2.36x10	$2^{8.64x10\^8}$	$\approx 10^{7.7x10(11)}$	$2^{3.19x10\^(9)}$	$\approx 10^{9.332x10\^(14)}$
sqrt(n)	10^{12}	$3.6x10^{15}$	$1.2x10^{19}$	$7.46x10^{21}$	$6.71x10^{24}$	$9.94x10^{26}$	$9.945x10^{30}$
n	10^6	$6x10^7$	$3.6x10^9$	$8.64x10^{10}$	$2.592x10^{12s}$	$3.1557x10^{13}$	$3.1557x10^{15}$
n^2	1000	7745	60000	293938	1609968	5615692	56175382
n^3	100	391	1532	4420	13736	31593	146677
2^n	19	25	31	36	41	44	51
n!	9	11	12	13	15	16	17
nlogn	62746	2801418	133378059	2755147513	71870656400	$7.9x10^{11}$	$9.9x10^{30}$