1.   (c)

2.   Three dependencies

$I_1 \leftrightarrow I_2$

$I_2 \leftrightarrow I_4$

$I_3 \leftrightarrow I_4$

frequency $= 2\,GHz$

$t = \dfrac{1}{2\,GHz} = 0.5\,ns$

	1	2	3	4	5	6	7	8	9	10	11
	IF	ID	EX	MEM	WB						
		IF	ID	EX	MEM	WB					
			IF	ID	EX	EX	EX	MEM	WB		
				IF	X	X	ID	EX	EX	MEM	WB

$\Rightarrow$ 11 cycles

$\Rightarrow$ Execution Time $= 11 \times 0.5 = 5.5\,ns$

$\Rightarrow$ (b) 3, 5.5 ns

3. (c)

4.   Transfer rate $= 10\,MBPS$

Amount of data $= 20\,kbytes$

$$= 20 \times 2^{10}$$

$$\text{Total time} = \frac{20 \times 2^{10}}{10 \times 2^{20}}$$

$$= 2 \times 2^{-10} \, s \simeq 2 \times 10^{-3} = 2 \, msec$$

Processor speed = 600 MHz

$$= 600 \times 10^6 \text{ cycles/sec}$$

Cycles required by CPU = 300 + 900

$$= 1200$$

$$\Rightarrow \text{Time} = \frac{\overset{2}{\cancel{1200}}}{\cancel{600} \times 10^6} = 2 \times 10^{-6}$$

$$= 0.002 \, msec$$

%age of processor time consumed $= \dfrac{0.002}{2 \times 1000} \times 100$

$$= .1\%$$

$$\Rightarrow (A)$$

5. (B) Both B and C are true only.