

Name: ..SAMPLE SOLUTIONS.....

Problem 1. (50 POINTS)

Answer briefly or as specified the following questions.

TYPE A

1. Eg : Microprocessor, processor, computer
2. hexadecimal 0x8a
3.
 - 2049KiB 4
 - 2MiB 3
 - 1000B 1
 - 1KiB 2
4. a=50, b=31, c=a+b=81, c=1010001, c=0x51.
5. Two of: Main Memory, I/O Modules, SystemBus.
6. von-Neumann.
7. 1MiB
8. Interrupt
9. Size, Cost, Speed.
10. To even out speed differences between two devices (eg disk-drive, memory, CPU)

Problem 2. (20 POINTS)

TYPE A. $0.15 \times 200 = H \times 20 + (1 - H) \times (20 + 200)$ and thus $H = .95$ or 95%.

Problem 3. (15 POINTS)

TYPE A. A cycle is $1/(2\text{GHz})$ i.e. $0.5 \times 10^{-9}\text{s}$ (0.5ns).

- (a) Elapsed time is $10M + 20M + 10M = 40M$ cycles i.e. 20ms as requested.
 (b) CPU utilization is $(10M + 10M)/(10M + 20M + 10M) = 50\%$.

Problem 4. (15 POINTS)

Program-A	Program-B	Answers	TYPE A
SET MAR 0x1004 1c	SET AC \$4 1cy	(a)	.205 cycle..
READ MEM 100c	ADD AC \$6 1cy		
MOV AC MBR 1c	HALT 1cy	(b)	...3 cycle..
SET MAR 0x1006 1c			
READ MEM 100c		(c)	.12.....
ADD AC MBR 1c			
HALT 1c			