

Computer Engineering Department, S V N I T, Surat.
Makeup Mid Sem Examinations, Nov 2018
B Tech II (CO) – 3rd semester
Course: Computer Organization (CO201)

Dated: 17th Nov 2018

Time: 11:00 hrs to 12:30 hrs

Max Marks: 30

Instructions:

1. Write your B Tech Admission No/Roll No and other details clearly on the answer books while write your B Tech Admission No on the question paper, too.
2. Assume any necessary data but give proper justifications.
3. Be precise and clear in answering the questions.

Q. 1 Answer the following [Any Five]:

[05]

1. Explain with the help of diagram, the concept of stored program computers.
2. From the six levels of computer, identify and explain two levels: "From these two levels - lower level can be omitted, if no modification required in the higher level data".
Explain the disadvantages of the computer internal storage architecture which is not found in today's machine.
4. Justify the statement: CISC supports less number of addressing modes.
5. List all the elements of the ISA instruction according to stored program computers.
6. Explain the ISA design principle which forces to have new instruction format.

Q. 2 Answer the following:

[10]

1. For the MIPS processor, write the MIPS instructions for the following C code segment:
for (i=1; i != 10; i++)
{ A[i] = 2*A[i-1]; }

[04]

The value in registers are the base address of arrays A in register \$s0 and I in register \$s1.

2. Consider the implementations of machine M having a clock rate of 100 MHz. The average number of cycles for each four instruction class and their frequencies for a program A are as follows:

[02]

Instruction Class	Machine M Cycles/Instruction Class	Frequency
A	2	40%
B	2	30%
C	4	15%
D	4	15%

A) Calculate the average CPI for this machine.

B) Calculate the average MIPS (Million Instructions Per Second) ratings for machine M.

3. Write and explain control hazard and its solutions.

[04]

- Q.3** When a device interrupt occurs, how does the processor determine which device issued the interrupt?

[03]

Q. 4 Answer the following [Any Four]:

[08]

1. Prove that the multiplication of two n -digit numbers in base B gives a product of no more than $2n$ digits.
2. Express in IEEE 32-bit floating-point format: $1/16$.
3. Differentiate between SRAM and DRAM in terms of application.
4. What are the major functions of I/O module?
5. Let's have a reference string: a, b, c, d, c, a, d, b, e, b, a, b, c, d and the size of the frame be 4. Find page fault using LRU.

Q. 5 Answer the following [Any One]:

[04]

1. Consider a single-platter disk with the following parameters:
 - Rotation speed: 7200 rpm
 - Number of tracks on one side of platter: 30000
 - Number of sectors per track: 600
 - Seek time: 1 ms for every hundred track traversed

Let the disk receive a request to access a random sector on a random track and assume the head starts at track 0.

- a. What is the average seek time?
 - b. What is the average rotational latency?
 - c. What is the transfer time for a sector?
 - d. What is the total average time to satisfy a request?
2. Use the Booth algorithm to multiply 23 (multiplicand) by -29 (multiplier), where each number is represented using 6 bits.