

VEER SURENDRA SAI UNIVERSITY OF TECHNOLOGY, BURLA  
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING  
& INFORMATION TECHNOLOGY  
SESSION 2014-2015 (EVEN SEMESTER)

( 4 )

6. (a) Write a program to compute  
$$X = (A + B \times C)(D - E \times F)$$
  
in a zero address, one address and two address machine. 5

(b) Consider a floating-point format with 8 bits for the biased exponent and 23 bits for the significand. Show the bit pattern for the number 0.645 in this format. 5

7. (a) With suitable diagram show how data flow in the Fetch cycle and Interrupt cycle. 5

(b) Write the sequence of control steps required to execute the instruction Add R4, R5, R6 in a single bus CPU architecture. 5

8. (a) State the relative advantages and disadvantages of different addressing modes. 5

(b) A PC-relative mode branch instruction is stored in memory at address  $620_{10}$ . The branch is made to location  $530_{10}$ . The address field in the instruction is 10 bit long. What is the binary value in the instruction? 5

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Total Pages-4

(Set-1)

**B.Tech-4th**  
**Computer Organization**

Full Marks : 70  
Time : 3 hours

Answer any six questions including  
Q.No.1 which is compulsory

*The figures in the right-hand margin indicate marks*

1. Answer the following questions : 2 × 10

(a) What are the four main components of any general purpose computers?

(b) What is the difference between sequential access and random access?

(c) What is the general relationship among access time, memory cost, and capacity?

(d) List two major function of a I/O module.

(e) What is the difference between postindexing and preindexing?

- (f) What is sign-extension rule for 2's complement number.
- (g) What is difference between the two complement representation of a number and the two complement of a number?
- (h) Give a reason for the use of Guard bit in floating point arithmetic.
- (i) What are the typical elements of a machine instruction?
- (j) What is the difference between big endian and little endian?
2. (a) Explain different approaches to handle multiple interrupt. 5
- (b) Consider a hypothetical microprocessor generating a 16-bit address and having a 16-bit data bus. What is the maximum memory address space that the processor can access directly if it is connected to a 16-bit memory? If an input and output instruction can specify an 8-bit I/O port number, how many 8-bit I/O ports can the processor support? 5

3. (a) List the differences among direct mapping, associative mapping, and set-associative mapping? 5
- (b) A set associative cache consists of 64 blocks, divided into 4-blocks per set. Main memory contains 4K blocks of 128 words each. Show the format of main memory addresses. 5
4. (a) List three techniques for performing I/O operation. Briefly explain each of them. 5
- (b) Explain, why DMA access to main memory is given higher priority than CPU access to main memory. 5
5. (a) Convert the following Infix expression to reverse Polish notation:  
 $(A \times B) + (C \times D) + E.$  5
- (b) Represent the number  $-1.5$  in IEEE 32-bit floating point format. 5