



USN

--	--	--	--	--	--	--	--	--	--

## Third Semester B.E. Degree Examination, June/July 2019 Computer Organization

Time: 3 hrs.

Max. Marks: 100

**Note: Answer any FIVE full questions, choosing ONE full question from each module.**

### Module-1

- 1 a. Write the basic performance equation. Explain the role of each of the parameters in the equation of the performance of the computer. (04 Marks)
- b. Draw and explain the connections between the processor and the main memory. (08 Marks)
- c. Write a program to evaluate the arithmetic statement  $Y = (A + B) * (C + D)$  using three – address, two-address, one-address and zero – address instructions. (08 Marks)

**OR**

- 2 a. What is an addressing mode? Explain any four addressing modes with examples. (08 Marks)
- b. Explain the concept of stack frames, when subroutines are nested. (06 Marks)
- c. Explain the shift and rotate operations with examples. (06 Marks)

### Module-2

- 3 a. Give comparison between memory mapped I/O and I/O mapped I/O. (04 Marks)
- b. Explain the following methods of handling interrupts from multiple devices.
  - i) Interrupt nesting /priority structure
  - ii) Daisy chain method. (08 Marks)
- c. What is bus arbitration? Explain distributed arbitration with a neat diagram. (08 Marks)

**OR**

- 4 a. Draw neat timing diagrams and explain :
  - i) Multicycle synchronous bus transfer for a read operation.
  - ii) Asynchronous bus transfer for a write operation. (12 Marks)
- b. Explain the following with respect to USB.
  - i) USB architecture
  - ii) USB addressing. (08 Marks)

### Module-3

- 5 a. With a neat diagram, explain the internal organization of a  $2M \times 8$  dynamic memory chip. (08 Marks)
- b. Distinguish between SRAM and DRAM. (04 Marks)
- c. Describe any two mapping functions in cache. (08 Marks)

**OR**

- 6 a. What is virtual memory? With a diagram, explain how virtual memory address is translated? (08 Marks)
- b. Define the following :
  - i) Memory latency
  - ii) Memory bandwidth
  - iii) Hit-rate
  - iv) Miss-penalty. (04 Marks)
- c. Describe the working principle of a typical magnetic disk. (08 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.





17CS34

**Module-4**

- 7 a. Convert the following pairs of decimal numbers to 5-bit signed 2's complement binary numbers and add them. State whether overflow has occurred.  
i) -5 and 7 ii) -10 and -13 iii) -14 and 11. (06 Marks)
- b. Draw 4-bit carry-look ahead adder and explain. (06 Marks)
- c. Explain Booth's algorithm, multiply +15 and -6 using Booth's multiplication. (08 Marks)

**OR**

- 8 a. Explain the concept of carry-save addition for the multiplication operation  $M \times Q = P$  for 4-bit operands, with diagram and suitable example. (08 Marks)
- b. Explain IEEE standard for floating - point numbers. (06 Marks)
- c. Perform the non-restoring division for  $8 \div 3$  by showing all the steps. (06 Marks)

**Module-5**

- 9 a. Draw and explain multiple bus organization of CPU. And write the control sequence for the instruction Add  $R_4, R_5, B_6$  for the multiple bus organization. (10 Marks)
- b. Explain with block diagram the basic organization of a micro programmed control unit. (10 Marks)

**OR**

- 10 a. With block diagram, explain the working of a microwave oven. (10 Marks)
- b. Explain the structure of general-purpose multiprocessors with diagrams. (10 Marks)

\*\*\*\*\*