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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 (08 Marks)
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)

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)

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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)

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