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P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)

Fourth Semester, B.E. - Computer Science and Engineering

Semester End Examination; June/July - 2015

Computer Organization

Time: 3 hrs *Max. Marks: 100*

***Note**: Answer **FIVE** full questions, selecting **ONE** full question from each **Unit**.*

UNIT - I

1 a. Explain the interface connection between processor and memory block, with a diagram, along with all the registers. 10

b. Define stack frame, illustrate the use of stack frame mechanism for implementing subroutines. 6

c. Explain Big-endian and little-endian assignments. 4

2 a. Define addressing mode. Explain any 4 addressing modes used in modern processor with example for each. 10

b. Explain the different types of instructions based on their operations with examples. 10

UNIT – II

3 a. Explain the two methods of handling multiple devices. 10

b. Explain the architecture and protocol of USB. 10

4. a. Explain why Bus arbitration is required? Explain with block diagram bus arbitration using Dairy chain. 10

b. Explain with a block diagram a general 8 – bit parallel interface circuit. 10

UNIT - III

5. a. Describe the operation of 2M X 8 asynchronous DRAM chip. 8

b. Explain the direct mapping function. 6

c. Consider a cache with 8 word blocks. It takes one clock cycle to send an address to main memory. The first word is accessed in 4 clock cycles / word. Calculate the total time needed to load the block into the cache using inter leaved and non- inter leaved memory. 6

6. a. Explain the virtual memory address translation technique using paging. 10

b. Explain the different categories of ROM. 4

c. Explain the role of a memory controller in memory system. 6

UNIT - IV

7. a. Explain the Booth's algorithm. Indicate the computational details for multiplying 2 numbers – 13 and + 09 and verify the result. 8

b. Explain the hardware implementation of floating – point addition / subtraction operations of a 32-bit floating point operands. 12

Contd…2

8. a.	With a circuit diagram, explain the restoring method division algorithm. Perform 11001 ÷ 100 using restoring division method.	10
b.	Describe the circuit and operation of a 4 – bit carry look ahead adder.	6
c.	Write and explain IEEE standard for floating point representation.	4

UNIT - V

9 a.	Explain the single – bus organization of the data path inside a processor.	10
b.	Write the control sequence to execute the instruction Add (R3) +, R1.	6
c.	Define the terms; i) Control word (cw) ii) Control store iii) Microroutine iv) Microinstruction.	4
10a.	Explain the design of a complete processor with a block diagram.	8
b.	What is the basic idea of instruction pipelining? Explain 4 stage pipelining.	12

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