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Question Paper Code: 53203

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2019

Third Semester

Computer Science and Engineering

15UCS303 - COMPUTER ORGANIZATION AND ARCHITECTURE

(Common to Information Technology)

(Regulation 2015)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions

PART A - (5 x 1 = 5 Marks)

1. Component of CPU which is responsible for comparing contents of two pieces of data is CO1-U
(a) ALU (b) CU (c) Memory (d) Register
2. CPU gets the address of next instruction to be processed from CO1-U
(a) Instruction register (b) Memory address register (c) Index register (d) Program counter
3. Which among the following is the fastest cache mapping function? CO3-U
(a) Fully associative mapping (b) Set associative mapping
(c) Direct mapping (d) None of the above
4. Larger page sizes leads to - _____ CO4-U
(a) Transfer errors (b) Increase in operation time
(c) Increase in access time (d) Decrease in performance
5. In _____ mode, the I/O module and main memory exchange data directly, CO4-U
without processor involvement.
(a) Programmed I/O (b) DMA (c) Interrupt-driven I/O (d) All the above

PART – B (5 x 3= 15Marks)

6. Name the functional units of a computer. CO1- R
7. Suppose the size of the Main Memory is 16K * 8 bits. What are the sizes of address bus and data bus? CO1-App

8. Define Underflow and Overflow. CO2- R
9. What would be the effect, if we increase the number of pipelining stages? CO3- U
10. An address space is specified by 24-bits and the corresponding memory space by 16-bits:How many words are there in the virtual memory and main memory? CO4-App

PART – C (5 x 16= 80Marks)

11. (a) Draw and explain block diagram of simple computer with the functional units. CO1- U (16)
- Or
- (b) Why do we use addressing modes ? Explain the different types of Addressing modes with example. CO1- U (16)
12. (a) Illustrate Booth’s algorithm with an example. CO2-App (16)
- Or
- (b) Demonstrate the division of 1000_2 by 11 using restoring method, draw block diagram and explain the operation. CO2-App (16)
13. (a) Explain the floating point Add/Subtract rules. With a detailed flowchart explain how floating point addition/subtraction is performed. CO2- U (16)
- Or
- (b) What is a Data hazard? How do you overcome it? And discuss its side effects. CO3- U (16)
14. (a) Draw and explain the simple combine data path for the MIPS architecture. CO3- U (16)
- Or
- (b) What is a mapping function? What are the ways the cache can be mapped? CO4- U (16)
15. (a) Explain the virtual memory address translation and TLB with necessary diagram. CO4- U (16)
- Or
- (b) With a neat sketch explain the working principle of DMA. CO4- U (16)