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Question Paper Code: 94805

B.E./B.Tech. DEGREE EXAMINATION, NOV 2023

Fourth Semester

Information technology

19UIT405- COMPUTER ORGANIZATION AND ARCHITECTURE

(Regulations 2019)

Duration: Three hours

Maximum: 100 Marks

Answer All Questions

PART A - (10x 2 = 20 Marks)

1. What is Instruction Register (IR) and Program Counter (PC) used for? CO1- U
2. What are the two techniques used to increase the clock rate R? CO1- U
3. What is full adder? CO1- U
4. What are the ways to truncate the guard bits? CO1- U
5. Define MIPS. CO1- U
6. Give the format of MIPS R-type instruction. CO1- U
7. Draw the basic structure of Basic Structure of a Symmetric Shared Memory Multiprocessor CO1- U
8. What is Instruction Level Parallelism? CO1- U
9. Define memory cycle time. CO2- App
10. Specify the three types of the DMA transfer techniques? CO2- App

PART – B (5 x 16= 80Marks)

11. (a) Compare 0,1,2 and 3 address machines by writing a program to compute: CO2-App (16)
 $X=(A+BxC)/(D-ExF-GxH)$

Or

- (b) An instruction is stored at location 300 with its address field at location 301. The address field has the value 400. A processor register R1 contains the number 200. Evaluate the effective address if the addressing mode of the instruction is (i) direct; (ii) immediate; (iii) relative (iv) register indirect; (v) index with R1 register as the index register. CO2-App (16)
12. (a) Perform the integer division for the number $8/3$ using restoring division CO2-App (16)
- Or
- (b) Multiply given signed 2's complement numbers using bit pair recoding A=110011 (Multiplicand) B=101100 (Multiplier). CO2-App (16)
13. (a) Write the basic MIPS implementation of instruction set. CO2-App (16)
- Or
- (b) Examine the approaches would you use to handle exceptions in MIPS CO2-App (16)
14. (a) Consider a non-pipelined machine with 6 execution stages of lengths 50 ns, 50 ns, 60 ns, 60 ns, 50 ns, and 50 ns. CO2-App (16)
1. Find the instruction latency on this machine.
 2. How much time does it take to execute 100 instructions?
- Or
- (b) How fast execution can we expect from a parallel computer for a concrete application? CO3- Ana (16)
15. (a) Write the virtual memory and its importance with neat diagram. CO1- U (16)
- Or
- (b) Express mapping schemes used in cache memory. CO1- U (16)
- (i) Direct
 - (ii) Associate
 - (iii) Set associate