

14/05/19 (AN)

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B.E / B.Tech (FT) END SEMESTER EXAMINATIONS – APRIL / MAY 2019

COMPUTER SCIENCE AND ENGINEERING

THIRD SEMESTER

CS8301 COMPUTER ARCHITECTURE

(Regulation 2012)

Time: 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. What are the basic functional units of a computer?
2. Define Amdahl's law.
3. Write down the control sequence for Move(R1), R2..
4. Name the method for generating control signals.
5. Write a short note on principle of locality.
6. Define speculative execution.
7. What are the two approaches used to reduce delay in adders?
8. What are the two attractive features of Booths algorithm?
9. Define memory access time and memory cycle time.
10. Give the formula for the average access time experienced by the processor in the system with two levels of caches.



Part – B (5 x 16 = 80 marks)
(Question No.11 is Compulsory)

11. (i) Describe the different types of addressing mode with example. 8 Marks
(ii) State the CPU performance equation and discuss the factors that affect the system performance. 8 Marks
12. a) What is hazard with respect to pipelining concept? Explain its types with suitable examples. 16 Marks
(OR)
b) "Control is the most challenging aspect of the processor design and one of the hardest part of control is implementing exception." What do you understand from the term exception and explain how exceptions are handled in MIPS architecture with a diagram showing the function of data path with control to handle exceptions. 16 Marks

13. a) i. For the following code identify all data and name dependencies between the instruction and give dependency graph. 10 Marks

1. LD F0, O(R1)
2. ADD.D F4, F0, F2
3. S.D F4, O(R1)
4. L.D F0, -8(R1)
5. ADD.D F4, F0, F2
6. S.D F4, -8(R1)

ii. Tabulate the difference between the uniform memory access (UMA) and Non uniform memory access (NUMA) multiprocessor (any 3). 6 Marks

(OR)

b) i. Explain any 10 key characteristics of Graphics Processing Unit (GPU) that vary from Central Processing Unit (CPU). 10 Marks

ii. Justify why parallel processing programs been so much harder to develop than sequential programs? 6 Marks

14. a) Calculate the following problems using BOOTH'S ALGORITHM 16 Marks

- i. $(+13) \times (-6)$
- ii. $(+13) \times (+6)$
- iii. $(-13) \times (-6)$
- iv. $(-13) \times (+6)$

(OR)

b) i. Describe in detail Non – Restoring Division algorithms. 8 Marks

ii. Calculate 11010101×10110011 using Signed-Operand Multiplication. 8 Marks

15. a) A certain memory system has a 32 MB main memory, and a 64 KB cache, Blocks are 16 bytes in size. Show the fields in a memory address if the cache is

- i) Associative
- ii). direct-mapped
- iii). 8-way-set-associative

(OR)

b) With a neat sketch explain the I/O Interface Architecture for a DMA device. 16 Marks

