

Reg No.: \_\_\_\_\_

Name: \_\_\_\_\_

**APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY**  
**FOURTH SEMESTER B.TECH DEGREE EXAMINATION(S), DECEMBER 2019**

**Course Code: EC206**

**Course Name: COMPUTER ORGANISATION**

Max. Marks: 100

Duration: 3 Hours

**PART A**

*Answer any two full questions, each carries 15 marks*

Marks

- |   |  |     |
|---|--|-----|
| 1 | a) Explain with neat diagram a 32 bit ripple carry adder.  | (3) |
|   | b) With neat diagram explain Arithmetic Logic Unit   | (5) |
|   | c) Explain the R- type instruction format of MIPS with example   | (3) |
|   | d) Translate the following machine language code into MIPS assembly language:<br>0xAD310004                        | (4) |
| 2 | a) Design a 4×4 binary multiplier. Illustrate with an example  | (7) |
|   | b) Write notes on MIPS register set.   | (4) |
|   | c) Translate the following MIPS assembly code to MIPS machine language code in hexadecimal form: lw \$t2, 32 (\$0) | (4) |
| 3 | a) Explain how floating point numbers are represented in computer's memory.  | (6) |
|   | b) Differentiate Big-Endian and Little-Endian machines   | (4) |
|   | c) Explain load word and store word instructions with examples   | (5) |

**PART B**

*Answer any two full questions, each carries 15 marks*

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|---|---|------|
| 4 | a) With examples, explain the different addressing modes available in MIPS.                                 | (10) |
|   | b) Explain the control unit of a multi cycle processor  | (5)  |
| 5 | a) Explain the various steps for executing a program  | (9)  |
|   | b) What are the weaknesses of a single cycle processor. How are they eliminated in a multi cycle processor? | (6)  |
| 6 | a) What are exceptions ? How the exceptions are handled ?   | (7)  |
|   | b) Draw and explain datapath for single cycle implementation for R-type instructions.                       | (8)  |

**PART C**

*Answer any two full questions, each carries 20 marks*

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|---|--|------|
| 7 | a) With the help of a diagram, explain the concept of memory hierarchy.                                    | (5)  |
|   | b) Distinguish between Programmed I/O and Interrupt driven I/O   | (5)  |
|   | c) Explain how a virtual address is translated into a physical address in virtual memory using page table. | (10) |
| 8 | a) Differentiate between SRAM and DRAM   | (6)  |

- b) Write short notes on (i) Serial port (ii) Parallel port (4)
- c) Explain LRU replacement algorithm (4)
- d) Explain with diagram direct mapping method in cache memory. (6)
- 9 a) What is meant by ROM? Explain the various types of ROM (5)
- b) With the help of a circuit diagram, explain the working of a SRAM cell. (5)
- c) Explain the concept of cache memory. Also define Miss Rate, Hit Rate and Average memory access time. (10)

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