**KUMARAGURU**
college of technology
character is life

**B.E DEGREE EXAMINATIONS: NOV/DEC 2023**

(Regulation 2018)

Third Semester

**INFORMATION SCIENCE AND ENGINEERING**

U18IST3002: Computer Architecture

**CO2:** Apply the knowledge of arithmetic operations in the design of a fast adder.

**CO3:** Classify the control units present in a processor.

**CO4:** Analyze the various performance enhancement techniques of Cache memories.

**CO5:** Point out how the pipeline processor improves performance of a computer.

**Time: Three Hours**                                                                 **Maximum Marks: 100**

**Answer all the Questions:-**

**PART A (10 x 2 = 20 Marks)**

**(Answer not more than 40 words)**

| | | | |
|---|---|---|---|
| 1. | Compare RISC and CISC. | CO1 | [K$_2$] |
| 2. | Identify the purpose of using program counter in processing unit. | CO1 | [K$_3$] |
| 3. | List the purpose of using guard bits used in floating point arithmetic. | CO2 | [K$_1$] |
| 4. | Construct bit pair recoded multiplier for 1110100. | CO2 | [K$_3$] |
| 5. | Compare hard wired and microprogrammed control unit. | CO3 | [K$_2$] |
| 6. | Recall control word. | CO3 | [K$_1$] |
| 7. | What is register renaming? | CO4 | [K$_1$] |
| 8. | Define cache miss. | CO4 | [K$_1$] |
| 9. | Define hazard in pipelining. | CO5 | [K$_1$] |
| 10. | What is static branch prediction? | CO5 | [K$_1$] |

**Answer any FIVE Questions:-**

**PART B (5 x 16 = 80 Marks)**

**(Answer not more than 400 words)**

| | | | | | |
|---|---|---|---|---|---|
| 11. | a) | Illustrate the functional units of a computer system in detail. | 10 | CO1 | [K2] |
| | b) | Demonstrate any 3 addressing modes with example. | 6 | CO1 | [K2] |
| 12. | a) | Develop a 4 bit Carry lookahead adder and explain it. | 10 | CO2 | [K2] |
| | b) | Apply Booth multiplication algorithm for multiplying +13 and -6. | 6 | CO2 | [K3] |
| 13. | | Demonstrate microprogrammed control unit with appropriate diagram. | 16 | CO3 | [K2] |
| 14. | | Explain different cache memory mappings with appropriate examples. | 16 | CO4 | [K2] |
| 15. | | Explain pipelining concepts and how does data forwarding help in solving data hazard issue in pipelining. | 16 | CO5 | [K2] |
| 16. | a) | Solve 274/ 21 using restoring division. | 8 | CO2 | [K3] |
| | b) | Explain virtual memory organization in detail. | 8 | CO4 | [K2] |

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