

**R18**

**Code No: 153AG**

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**

**B. Tech II Year I Semester Examinations, September/October - 2023**

**COMPUTER ORGANIZATION AND ARCHITECTURE**

**(Common to CSE, CSBS, CSIT, CE(SE), CSE(CS), CSE(DS), CSE(N), AI&DS, AI&ML, CSD)**

**Time: 3 Hours**

**Max. Marks: 75**

**Note:** i) Question paper consists of Part A, Part B.

ii) Part A is compulsory, which carries 25 marks. In Part A, answer all questions.

iii) In Part B, Answer any one question from each unit. Each question carries 10 marks and may have a, b as sub questions.

**PART - A**

**(25 Marks)**

- 1.a) What is an instruction cycle? [2]
- b) Draw block diagram of digital computer. [3]
- c) What is an effective address? [2]
- d) Write a micro program to illustrate ADD operation. [3]
- e) Convert the following decimal numbers into hexadecimal numbers.  
i)  $(328)_{10}$       ii)  $(2039)_{10}$  [2]
- f) How can you perform subtraction of two binary numbers using 2's complement. [3]
- g) Distinguish between isolated and memory mapped I/O. [2]
- h) What is IBM 370 I/O Channel? Explain. [3]
- i) What are CISC characteristics? [2]
- j) Explain RISC pipeline process. [3]

**PART - B**

**(50 Marks)**

- 2.a) List and explain various instruction codes with examples.
- b) Explain hardwired and microprogrammed controls. [5+5]

**OR**

3. Explain arithmetic micro operations. Give suitable examples to support your explanation. [10]

4. Explain the general register organization. [10]

**OR**

- 5.a) Distinguish between register and register indirect addressing mode by giving suitable examples.
- b) List and explain various data transfer instructions. [4+6]

- 6.a) Draw the block diagram for BCD adder and explain.
- b) Write down the booth's multiplication algorithm and explain the process. [5+5]

**OR**

- 7.a) Explain the hardware for implementation of addition and subtraction of signed magnitude numbers.
- b) Draw the flowchart for decimal division and explain with an illustrative examples. [5+5]

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8. Explain asynchronous communication interface with detail illustration. [10]

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9. What are the software routines stored in memory for servicing interrupts? Explain them. [10]

10. Explain about the pipeline parallel processing technique. [10]

**OR**

11. Explain vector processing in detail. [10]

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