

2072

B.E. (Computer Science and Engineering)  
Fourth Semester  
CS-405: Computer Architecture and Organization

Time allowed: 3 Hours

Max. Marks: 50

**NOTE:** Attempt *five* questions in all, including Question No. 1 which is compulsory and selecting two questions from each Unit.

x-x-x

I. Attempt the following:-

- a) Draw the basic instruction format and indicate the number of bits in each part.
- b) How many 128 x 8 memory chips are needed to provide a memory capacity of 4096 x 16?
- c) Define the terms: (i) microoperation (ii) microinstructions
- d) Differentiate between external interrupts and internal interrupts.
- e) How do you solve the divide overflow condition in division operation? (5x2)

**UNIT - I**

- II. a) Design a 4-bit ALU which performs Arithmetic and Logical operations
- b) Differentiate between hardwired and Microprogrammed control unit. Is it possible to have a hardwired control associated with a control memory? (5,5)
- III. a) What are the various addressing modes? Explain any five with suitable example.
- b) What is an instruction cycle and discuss the phases of Instruction cycle? (6,4)
- IV. a) Derive an algorithm in flowchart form for adding and subtracting two fixed point binary numbers when negative numbers are in signed - 1's complement representation.
- b) Implement 4-bit Binary Adder-Subtractor and Binary Incrementer. (5,5)

**UNIT - II**

- V. a) Explain two ways for establishing priority of interrupts by multiple devices.
- b) Discuss the different mapping techniques used in cache memory and their relative advantages and disadvantages. (5,5)

P.T.O.



(2)

- VI. a) What do you understand by pipeline processing? Discuss pipeline hazards and their resolutions.
- b) Explain DMA transfer in detail with the help of a diagram. (6,4)
- VII. Write a short note on:-
- a) Virtual memory
- b) Parallel processing (5,5)

x-x-x