

Code No: 123BQ

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**B.Tech II Year I Semester Examinations, May/June - 2019****DIGITAL LOGIC DESIGN AND COMPUTER ORGANIZATION****(Information Technology)****Time: 3 Hours****Max. Marks: 75****Note:** This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit.

Each question carries 10 marks and may have a, b, c as sub questions.

PART - A**(25 Marks)**

- 1.a) Explain about Supercomputers and Grid computers. [2]
- b) Convert the number from $(102)_6$ to $(\ \)_8$. [3]
- c) Draw the JK Flip-flop circuit and write truth table of it. [2]
- d) Explain about multiplexers with a neat sketch. [3]
- e) Explain about byte addressability. [2]
- f) Explain about memory operations. [3]
- g) Explain about the basic structure for data processing. [2]
- h) Explain about Flash memory. [3]
- i) What is Vectored Interrupt? [2]
- j) Explain about PCI bus. [3]

PART - B**(50 Marks)**

- 2.a) Explain about the performance evaluation of computers.
 - b) Compare signed and unsigned binary numbers with table. [5+5]
- OR**
- 3.a) Convert the following pairs of decimal numbers to 5-bit 2's-complement numbers, then perform addition and subtraction on each pair. Indicate whether or not overflow occurs for each case.
 - i) 7 and 13
 - ii) -12 and 9
 - b) Explain about Floating-Point Representation with an example. [5+5]
- 4.a) Simplify the following Boolean function F , together with the don't-care conditions d , and then express the simplified function in sum-of-min terms form.
 $F(x,y,z) = \sum(0, 1, 4, 5, 6)$ $d(x,y,z) = \sum(2, 3, 7)$
 - b) Explain about Shift Registers with an example. [5+5]
- OR**
- 5.a) Design a combinational circuit that compares two 4-bit numbers to check if they are equal. The circuit output is equal to 1 if the two numbers are equal and 0 otherwise.
 - b) Explain about ripple counter and ring counters. [5+5]

- 6.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) Design a Floating-point addition-subtraction unit. [5+5]

OR

- 7.a) Discuss about Instructions and Instruction Sequencing.
- b) Explain about different types of Instruction Formats. [5+5]

- 8.a) Explain about multiple bus organization with a neat sketch.
- b) Explain about Microprogrammed control unit organization. [5+5]

OR

- 9.a) Explain about the internal organization of memory chips in detail.
- b) Discuss about different mapping techniques used in cache memory. [5+5]

- 10.a) Discuss about accessing I/O devices.
- b) Explain about interrupt hardware and enabling and disabling interrupts. [5+5]

OR

- 11.a) Explain about DMA interface.
- b) Explain about input interface circuit. [5+5]

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