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# B.TECH.

## THEORY EXAMINATION (SEM–IV) 2016-17

## COMPUTER ARCHITECTURE & ORGANIZATION

*Time : 3 Hours* *Max. Marks : 100*

*Note : Be precise in your answer.*

### SECTION – A

**1 Answer all the questions.** **10x2=20**

**a)** Explain shortly the different performance measures used to represent a computer system's performance.

**b)** Design a full adder using half adder.

**c)** Give the IEEE T54standard 32-bitfloating pointing number format.

**d)** Define effective address of data.

**e)** Define Normalization and Biasing.

**f)** Write down the difference between structure and behaviour in the digital system context.

**g)** What are the characteristics of vertical micro instructions?

**h)** "Hardwired control unit is faster than micro programmed control unit." Justify this statement.

**i)** What do you understand by design levels in. the design of computer system?

**j)** What is multiprogramming and pipelining?

### SECTION-B

**2 Answer any five questions of the following.** **5x10=50**

**a)** Describe the design of a 4-bit carry look ahead adder.

**b)** Explain the Daisy chaining mechanism for bus arbitration. Analyze the three bus arbitration methods-Daisy chaining, polling and independent requesting with respect to communication reliability in the event of hardware failures.

**c)** What is addressing mode? Explain the various types of addressing modes with example.

**d)** Give the block diagram of microprogram sequencer for a control memory and explain it properly.

**e)** Design a data path unit with an ALU and a register file.

**f)** Draw a structure of an 8M x 8 bit DRAM chip. Also explain its specification.

**g)** Explain the organization of four stage pipeline.

**h)** Explain the difference between hardwired control and micro-programmed control. Is it possible to have a hardwired control associated with a control memory? Also define the following terms :

i) Microoperaion
ii) Microinstruction
iii) Microcode
iv) Microprogram.

### SECTION-C

**Answer any two questions of the following.** **2x15=30**

**3.** Explain how Booth's algorithm is suitable for signed number multiplication. Perform the multiplication of the following using Booth algorithm - 4 x - 5.

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4. Draw the functional block diagram of 8085 microprocessor and explain it in detail.

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5. Write short notes on any three
   - i) Cache memory
   - ii) Fixed point arithmetic
   - iii) Vertical and horizontal microprogram
   - iv) RISC and GISC

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