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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.

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

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