Printed Pages: 4 NCS - 505

(Following Paper ID and Roll No. to be filled in your Answer Books)

Paper ID : 2289917 Roll No.

B.TECH.

Regular Theory Examination (Odd Sem-V) 2016-17

COMPUTER ARCHITECTURE

Time : 3 Hours *Max. Marks : 100*

Section - A

Note: Attempt all questions **(10×2=20)**

1. Define following terms

i) RTL ii) Micro-Operation

2. Define -Sequencer

3. Explain one, two and three address instruction.

4. Define the following terms.

i) Effective address

ii) Immediate instruction

5. Explain the following terms

i) PSW

ii) Delayed load.

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6. Differentiate SIMD an MIMD

7. What are the Modes of data transfer?

8. What is an interrupt?

9. Differentiate between Synchronous and Asynchronous transmission.

10. What is cache memory used for?

Section - B

Note: **Attempt five questions.** **(5×10=50)**

1. Show the contents of the registers E, A, Q, SC during the process of multiplication of two binary numbers 11111(multiplicand) 10101. (multiplier). The signs are not included.

2. In an instruction format, there are 16 bits in an instruction word. Bit 0 to 11 convey the address of the memory location for memory related instructions. For non memory instructions these bits convey various register or I/O operations. Bits 12 to 14 show the various basic memory operations such as ADD, AND, LDA etc. Bit 15 Shows if the memory is accessed directly or indirectly. For such an instruction format draw block diagram of the control unit of a computer and briefly explain how an instruction will be decoded and executed, by this Control Unit.

3. Write an assembly level program for the following pseudocode.

   SUM=0

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SUM=SUM+A+B

DIF=DIF-C

SUM = SUM+DIF

4. Explain Microprogram Sequencer for a control memory using a suitable block diagram.

5. Give the detailed comparison between RISC and CISC.

Section - C

Note: Attempt any two questions (2×15=30)

1. Explain the Booth's algorithm in depth with the help of flowchart. Give an example for multiplication using Booth's algorithm.

2. How main memory is useful in computer system? Explain the memory address map of RAM and ROM.

3. a) Draw a block diagram of a Computer's CPU showing all the basic building blocks such as Program counter, Accumulator, Address and Data Registers, Instruction Register, Control unit etc. and describe how such an arrangement can work as a computer, if connected properly to Memory, input/ Output etc

   b) Describe the subroutine. Write a program which move the block of data.

4. Explain the operation of three state bus buffers and show its use in design of common bus.

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5. Explain 4 bit incrementer with a necessary diagram.

6. Write a program loop using a pointer and a counter to clear the contents of hex locations 500 to 5FF with 0.

7. Demonstrate the process of Second Pass of Assembler using a suitable diagram.

8. Explain

   i) Vector Processing

   ii) Vector Operations. Explain how matrix multiplication is carried out on a computer supporting Vector Computations.

9. Explain Flynn's classification of computers.

10. How addressing mode is significant for referring memory? List and explain different types of addressing modes.

11. What is a Memory Stack? Explain its role in managing subroutines with the help of neat diagrams.

12. What is stack? Give the organization of register stack with all necessary elements and explain the working of push and pop operations.

13. Write a note on subroutines.

14. Draw the block diagram of control unit of basic computer. Explain in detail with control timing diagrams.

15. List and explain different types of shift micro-operation.

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