Code No: 116

VASAVI COLLEGE OF ENGINEERING *(Autonomous)* HYDERABAD
MCA. I/III I-Semester(Main) Examinations, March-2015

Computer Organization

Time: **3** hours Max. Marks: **70**

*Note: Answer **ALL** questions in **Part-A** and any **FIVE** questions from **Part-B***

Part-A (Marks: 10 X 2=20)

1. Simplify the Boolean Function F(x,y,z) = x'yz+ xyz+ xy'z+x'yz' using Boolean theorems.
2. Write the characteristic table and excitation table for RS, JK, T, and D Flip Flops.
3. Write the different types of instruction formats.
4. Write the register transfer statements for fetch phase and decode phase of Instruction cycle.
5. Write an assembly language program to add two 8-bit binary numbers and store the result in register R1.
6. Define the terms control word, control memory, micro program, and micro instruction.
7. Write any four differences between RISC and CISC.
8. Discuss the advantages of DMA data transfer modes.
9. Illustrate with example how to handle interrupts.
10. Determine the number of clock cycles that it takes to process 500 tasks in a 5-stage pipeline. Assume each segment takes one clock cycle.

Part-B (Marks: 5 X 10=50)

11. a) State the significance of Normalized representation of floating point numbers. Illustrate with example. **(5)**
    b) Convert the given decimal number $(124)_{10}$
    i) Binary ii) Octal iii) Hexadecimal iv) Binary-Coded Octal **(5)**

12. a) Draw the flowchart and explain the phases of instruction cycle in general purpose computer with register transfer statements in each phase. **(7)**
    b) Draw the timing diagram for each phase in instruction cycle. **(3)**

13. a) Illustrate with example about the assembly language instructions to perform arithmetic and logic operations and I/O operations. **(5)**
    b) What is control field encoding? **(5)**

14. a) Convert the given expression (A+B – C/D + E*F – G) using **(6)**
    i) One address instruction format for accumulator based CPU
    ii) Two address instruction format for general purpose register CPU
    b) Distinguish between Micro programmed control unit and Hardwired control unit. **(4)**

15. a) Write the differences between isolated I/O and memory mapped I/O. **(5)**
    b) Explain the importance of Associative memory with example. **(5)**

16. a) Simplify the Boolean function F(w,x,y,z) = Σ (0,1,2,3, 4,11,12) to minimum number of literals. Use K-Map method and Realize the Boolean function with minimum number of NAND gates. **(5)**
    b) Describe the organization of cache memory using direct mapping technique. **(5)**

17. a) Explain any three addressing modes with example for each. **(5)**
    b) Explain the Booth's Multiplication algorithm. **(5)**

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