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MID SEMESTER EXAMINATION-2015

B.Tech IV Semester

COURSE CODE: 10B22CI421

MAX. MARKS: 30

COURSE NAME: Computer Organization

COURSE CREDITS: 4

MAX. TIME: 2 HRS

Note: All questions are compulsory.

Section A

(Marks: 6*1=6)

1. Simplify the following Boolean functions using 3 variable maps.
 - a. $F(x,y,z) = \sum(1,2,3,6,7)$
 - b. $F(A,B,C) = \sum(3,5,6,7)$
2. Convert the following numbers with their indicated bases to decimal:
 - a. $(15482)_3$
 - b. $(5376)_6$
3. Write your full name in ASCII using an 8-bit code. Also convert the space between the names.
4. Convert your roll number to binary. Assume the converted binary number is stored in register R. What is the register value after twice arithmetic shift right?
5. A line of code in an assembly language program is as follows:
HEX 40
Show that four memory words are required to store the line of code and give their binary content
6. How many references to memory are needed for indirect and direct instructions to bring an operand into a processor register?

Section B

(Marks: 3*3=9)

7. The 8 bit registers AR, BR, CR and DR initially have the following values:

AR = 10101101

BR = 10100101

CR = 11110111

DR = 01010101

Determine the 8 bit values in each register after the execution of the following sequences of micro operations.

AR -> AR+BR

(Add BR to AR)

CR \rightarrow CR \wedge DR, BR \rightarrow BR+1

(AND DR to CR, increment BR)

AR \rightarrow AR - CR

(subtract CR from AR)

All the operations are independent.

8. Give a neat labeled diagram of selection of address for control memory. Explain the process of execution of micro operations.
9. Write a program in assembly language to add two Hexadecimal numbers 5AB3 and 5728

Section C

(Marks: 5*3=15)

10. Show the contents in hexadecimal of registers PC, AR, DR, IR, SC of the basic computer when the initial content of PC is E76F. The content of the memory at address 76F is 7FAB. The content of the memory at address FAB is FFFF. Give the answer in a table with 5 columns, one for each register and a row for each timing signal. Also, give the contents of the registers after the complete instruction is executed.
11. Write a program in assembly language to move a block of data of 20 numbers from address F461 to 5AB5
12. Can we have an assembler with single pass? Explain the two passes of an assembler with the help of flowcharts for both the passes.

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