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BMS College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

December 2017 Semester End Main Examinations

Course: Computer Organization and Embedded Systems **Duration: 3 hrs.**
Course Code: 15IS3DCCOE **Max Marks: 100**
Date: 14.12.2017

Instruction: **Answer any FIVE full questions, choosing one from each Unit.**

UNIT 1

1. a) Register R1 and R2 of a computer contain the decimal values 1200 and 4600. What is the effective address of the memory operand in each of the following instructions? Analyze. **05**

i) Load 20(R1), R5 ii) Move #3000, R5 iii) Add –(R2), R5 iv) Subtract (R1)+, R5

b) Write a program that can evaluate the expression A* B + C* D in a single accumulator processor. Assume that the processor has Load, Store, Multiply and Add instructions and that all values fit in the accumulator. **05**

c) Compare little endian and Big-Endian byte assignment. Also discuss aligned addresses and byte addressability. **06**

d) What is performance measurement? Analyze the overall rating for the computer in a program suite. **04**

UNIT 2

2. a) Bring out a contrast between Hardwired control and Microprogrammed control. **07**

b) With an example, explain the field coded microinstructions. **08**

c) Write down the control sequence for the instruction Add R4, R5, R6 for three-bus Organization. **05**

UNIT 3

3. a) Write an assembly language program to read a line of characters and display it back to the display device. The program stops reading characters when enter key is pressed. **06**

b) Differentiate between parallel and serial interface circuits. **06**

c) Define bus arbitration, elaborate on any one bus arbitration approach. **08**

OR

4. a) With a neat diagram, examine the translation of a virtual address to a physical address. **08**

b) Evaluate the different approaches to improve cache performance. **06**

c) Describe parallel port interface circuit with block diagram. **06**

UNIT 4

5. a) Perform the following operations on the 5-bit signed numbers using 2's complement representation system. Also indicate whether overflow has occurred. **10**

i) (-10) + (-13) ii) (-10) – (+4) iii) (-3) + (-8) iv) (-10) – (+7)

b) Interpret the steps to perform floating point addition, subtraction, multiplication and division operation. **06**

c) Summarize the procedures involved in restoring and non-restoring division. **04**

UNIT 5

6. a) Demonstrate the working of an embedded system with an example. **10**

b) Why are microcontrollers/microprocessors used in the design of embedded system? Discuss the characteristics of embedded system. **10**

OR

7. a) Assess the role of sensors and actuators in embedded systems with a neat diagram. **10**

b) Illustrate the working of digital camera with a block diagram. **10**

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