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BMS College of Engineering, Bangalore-560019

(Autonomous Institute, Affiliated to VTU, Belgaum)

January 2017 Semester End Make Up Examinations

Course: **Computer Organization and Embedded System**
Course Code: **15IS3DCCOE**

Duration: **3 hrs**
Max Marks: **100**
Date: 12.01.2017

Instructions: 1. Answer any five full questions choosing one from each unit.
2. Assume missing data (if any) suitably

UNIT 1

1. a) List the steps required to execute the Store R4,LOC machine instruction **05**
b) Apply indirect addressing mode to determine the length of the string and store it in location LENGTH. Assume that there is a string of ASCII-encoded characters stored in memory starting at address STRING and the string ends with the Carriage Return (CR) character. **08**
c) Assume you have a machine that uses a 32-bit integers and you are storing the hex value 1234 at address 0. **07**
 - a) Show how this is stored on a big endian machine
 - b) Show how this is stored on a little endian machine
 - c) If you wanted to increase the hex value to 123456, which byte assignment would be more efficient? Explain your answer

UNIT 2

2. a) Explain the basic structure for data processing with a neat diagram **05**
b) Apply the datapath organization in a processor to list the sequence of actions needed to execute ADD R3,R4, R5 instruction with an data path diagram. **10**
c) What are the approaches used for generating control signals to cause the fetch and execute instructions in the correct sequence and at the correct time. Explain the organization of the hardware needed for micro programmed control with a neat diagram **05**

UNIT 3

3. a) Explain the need of signaling protocol and the organization of registers in the keyboard and display interfaces. **06**
b) Apply programmed control approach to read, store and display a line of characters typed at the keyboard using RISC-Style processors. **06**
c) Explain an interface circuit for an 8-bit input port that can be used for connecting an input device keyboard **08**

OR

4. a) Define the steps to be taken on cache miss and define write-through and write-back **10**
b) Explain the virtual address translation into physical address **10**

UNIT 4

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| 5. | a) | Construct a ripple carry and a carry save arrays for 4 x 4 multiplier | 08 |
| | b) | Apply booth and bit-pair recoding algorithm to multiply the multiplicand A=110101 and B=011011 | 06 |
| | c) | Outline the general procedure to perform addition, subtraction and multiplication of floating point numbers using single precision IEEE standard format | 06 |

UNIT 5

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| 6. | a) | Illustrate the processing and control capability of array of optical sensors used in capturing the images | 10 |
| | b) | Explain the block diagram of a microcontroller chip | 10 |

OR

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| 7. | a) | Illustrate the two applications of sensors and actuators | 10 |
| | b) | Explain the addressable registers of the serial interface with a neat diagram | 10 |
