

# BMS College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

## January 2018 Semester End Make Up Examinations

Course: Computer Organization and Embedded Systems  
Course Code: 15IS3DCCOE

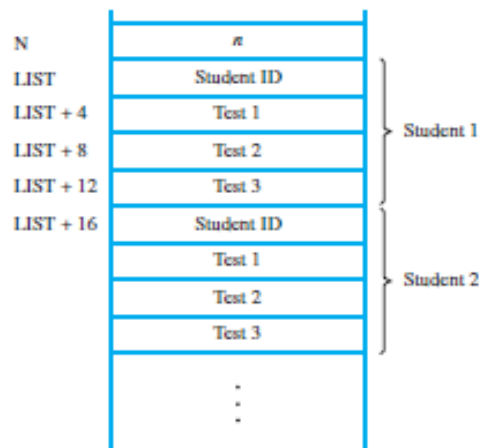
Duration: 3 hrs.  
Max Marks: 100  
Date: 09.01.2018

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

### UNIT 1

1. a) List the steps needed to execute the machine instruction: Store R4, LOC. 05
- b) Show how the following values would be stored by machines with 32-bit words, using little endian and then big endian format. Assume each value start at address 10. Draw a diagram of memory for each, placing the appropriate values in the correct memory location. 05
  - a) 456789A1      b) 14148888
- c) Write a program to calculate test marks for the list of N students using indexed addressing mode. 10

**2.4 ADD**



### UNIT 2

2. a) Analyze the sequence of actions needed to fetch and execute the instruction with a neat diagram **Load R6, 1000(R9)**. 10  
At the time the instruction is fetched, R6 and R9 contain the values 4200 and 85320, respectively. Memory location 86320 contains 75900. Show the content

of the interstage registers during each of the 5 execution steps of this instruction.

- b) Describe the organization of micro programmed control unit. Define the following terms: **10**  
microinstruction, micro operation, micro routine, control store.

### **UNIT 3**

3. a) State the differences between memory mapped I/O and I/O mapped I/O. **04**  
b) Write a program that reads a line of characters and displays it using RISC – **06**  
Style program controlled I/O approach.  
c) With a neat diagram of Parallel Port interface circuit, provide detailed **10**  
description on keyboard input interface.

### **OR**

4. a) Demonstrate the input operations of synchronous bus with timing diagram. **06**  
b) Describe the following (i) Interrupt Nesting (ii) Bus Arbitration **10**  
c) How many total bits are required for a direct-mapped cache with 16KB of data **04**  
and 4-word blocks, assuming a 32-bit address?

### **UNIT 4**

5. a) Perform the division 11001 by 100 using Non-Restoring method. **10**  
b) Apply Booth's and Bit-Pair recording of multipliers for the multiplication of **06**  
01101 with 01001  
c) Highlight the representation schemes used in IEEE standard for floating point **04**  
numbers.

### **UNIT 5**

6. a) Discuss the components of a microcontroller in detail with block diagram. **10**  
b) Provide diagrammatic representation of microwave oven embedded **10**  
application with detailed description.

### **OR**

7. a) Give the parallel I/O interface for a microcontroller with Registers and explain. **10**  
b) Provide the block diagram of a Digital Camera Embedded application. Detail **10**  
on functionalities of main parts in the camera.

\*\*\*\*\*