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NMCA-215

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 214222

Roll No.

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M.C.A. (Semester-II)**SPL. THEORY EXAMINATION, 2014-15****COMPUTER ORGANIZATION***Time : 3 Hours]**[Total Marks : 100***Note:** Attempt all questions. All question carry equal marks.

- Q1. Attempt any four parts of the following: (5x4=20)
- Register A holds the 8-bit binary 11011001. Determine the B operand and the logic micro-operation to be performed in order to change the value in A to :
 - 01101101
 - 11111101
 - Design a 4-bit adder-subtractor with complete block diagram.
 - Show the step by step process of Booth's multiplication with the help of flowchart.
 - What is memory transfer? What are different registers associated for memory transfer? Discuss.

- (e) Show the hardware that implements the following statements. Include the logic gates for the control function and a block diagram for the binary counter with a count enable input.

$$xyT_0 + T_1 + y'T_2 : AR \leftarrow AR + 1$$

- (f) Construct the 4-line bus using multiplexers and explain it.

Q2. Attempt any four parts of the following : (5×4=20)

- Explain Micro-programmed control unit.
- Discuss multiple bus organization.
- Explain the process of fetching a word from memory and storing a word in memory.
- What is the role of Instruction Register (IR)? Write the steps used to execute IR.
- Discuss the Pre-fetching of micro-instructions.
- Discuss Micro-instruction with Next address field.

Q3. Attempt any two parts: (10×2=20)

- What do you mean by processor organization? Discuss
 - Single accumulator based processor organization.
 - General-register based processor organization.
 - Stack based processor organization.
- What do you mean by addressing mode? Describe various addressing modes with suitable examples.

- A computer has 32 bit instructions and 12-bit addresses. If there are 250 two-address instructions, how many one-address instructions can be formulated?

Q4. Attempt any two parts: (10×2=20)

- Why Input output interface is required? Describe various methods for I/O interface.
- Define interrupt. When a device interrupt occurs how does the processor determine which device has issued the interrupt?
- Write short notes on the following:
 - Input-output processor
 - Serial Communication

Q5. Attempt any two parts: (10×2 = 20)

- Discuss the RAM chip design. A computer uses RAM chips of 1024×1 capacity.
 - How many chips are needed and how their address lines be connected to provide a memory capacity of 1024 bytes?
 - How many chips are needed to provide a memory capacity of 16KB?
- What is meant by cache mapping? Explain different types of mapping techniques with examples.
- What do you mean by memory management hardware? Explain the basic components of memory management unit.