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Total No. of Questions : 09] [Total No. of Pages : 02

MCA (Sem. - 3rd)

COMPUTER SYSTEM ARCHITECTURE

SUBJECT CODE : MCA - 301

Paper ID : [B0111]

[Note : Please fill subject code and paper ID on OMR]

Time : 03 Hours **Maximum Marks : 60**

Instruction to candidates :

1) Attempt any one question from each sections - **A, B, C & D.**
2) Section-E is **Compulsory**.
3) Use of Non-programmable **Scientific Calculator** is allowed.

Section - A *(1 x 10 = 10)*

Q1) Explain the operation of a twisted-ring counter and give its state diagram.

Q2) What is shift register? Draw the diagram of 4-bit bidirectional shift register and explain its working.

Section - B *(1 x 10 = 10)*

Q3) What do you mean by Addressing modes of instruction? Explain the various addressing modes of instructions.

Q4) What are the various types of registers and their function in basic computer? Explain with block diagram the control unit of basic computer.

Section - C *(1 x 10 = 10)*

Q5) Explain in detail the working of micro programmed control unit.

Q6) Explain in detail the characteristics of RISC and CISC architecture.

Section - D

(1 x 10 = 10)

Q7) What is mapping process in cache memory? Discuss various mapping procedures.

Q8) What is associative memory? Explain hardware organization of associative memory with diagram.

Section - E

(10 x 2 = 20)

Q9) a) What is the race around condition?

b) What is the difference between a direct and an indirect address instruction?

c) What is the difference between a software interrupt and subroutine call?

d) Give two applications of three-Address instructions.

e) What is virtual memory?

f) What is the relation between address and memory space in a virtual memory system?

g) What is the function of sequencer in micro programmed control organization?

h) Define microinstruction, micro operation and micro program?

i) How to convert the J-K flip flop to D type Flip flop?

j) List various memory reference instructions.