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

MCA (Sem. - 3rd)

COMPUTER SYSTEM ARCHITECTURE

SUBJECT CODE :MCA - 301 (N2)

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 × 10 = 10)

Q1) What are the different types of flip flops? Explain with the help of logic diagrams and truth tables.

Q2) (a) Explain the working of BCD ripple counter with the help of logic diagram.

(b) What are multiplexers and demultiplexers? Discuss their applications.

Section - B

(1 × 10 = 10)

Q3) What is an instruction execution cycle? Explain the sequence of control signals to be generated to fetch an instruction from memory in a single-bus organization.

Q4) Explain the use of vectored interrupts in processors. Why is priority handling desired in interrupt controllers? How do the different priority schemes work?

Section - C

(1 × 10 = 10)

Q5) Explain in detail the microprogrammed control unit. What are its advantages and disadvantages?

Q6) Differentiate between the various bus systems. Sketch the timing diagram of an input transfer on a synchronous bus.

Section - D

(1 × 10 = 10)

Q7) (a) Explain the role of the cache memory in memory hierarchy to speed up instruction execution time.

(b) Explain how direct mapping and associative mapping functions are implemented in cache memories.

Q8) (a) Explain the internal organization of semi conductor RAM memories.

(b) What is virtual memory? Explain how the virtual memory address is translated to physical address in main memory.

Section - E

(10 × 2 = 20)

Q9)

a) What is an XOR gate? Draw its truth table.

b) What are sequential circuits?

c) What is race around condition?

d) What is an opcode? Give example.

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

f) Distinguish between arithmetic and logical shifts.

g) Can a processor put data to any bus or read data from any bus? Explain.

h) What do you mean by end-around carry correction?

i) What is the difference between a subroutine and an Interrupt-Service routine?

j) Distinguish between static and dynamic RAM.