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MCA 2nd Semester Examination

Computer Architecture (NS)

MCA-204

Time : 3 Hours   Max. Marks : 60

e candidates shall limit their answers precisely within the answer-book (40 pages) issued to them and no supplementary/continuation sheet will be issued.

Note : Attempt five questions in all, selecting only one from each Section. Q. No. 9, Section-E, is compulsory.

SECTION - A

1. (a) Explain the significance of RTL in the implementation of digital systems. (5)

   (b) Discuss three-state bus buffer system. (5)

2. (a) Name the four basic logic micro- operations by providing one application of each. (5)

   (b) Explain the gate structure for controlling AC register. (5)

SECTION - B

3. (a) Explain the working of two pass assembler in brief. (5)

   (b) What is the importance of stack organization in CPU? Explain how stack is used for evaluating arithmetic expressions. (5)

4. (a) Describe and compare RISC and CISC architectures. (5)

(b)   What is the function of control memory? Explain microinstruction format for control memory.   (5)

SECTION - C

5. (a)   What do you understand by the term 'array processor'? Explain with an example for adding two vectors C=A+B.   (5)

(b)   Describe multiplication of two floating point numbers with an example.   (5)

6. (a)   What are the difficulties that cause an instruction pipeline to deviate from its normal operation? Explain any one in detail.   (5)

(b)   Explain BCD adder with a suitable diagram.   (5)

SECTION - D

7. (a)   What is Asynchronous Data Transfer? Describe strobe control method.   (5)

(b)   Describe associative memory, cache memory and virtual memory.   (5)

8. (a)   Explain how mutual exclusion is enforced with a semaphore in multiprocessor system.   (5)

(b)   What are different modes of data transfer to and fro from peripherals? Explain DMA.   (5)

SECTION - E

9.   Answer the following briefly:

(i)   What is a decoder?

(ii)   Differentiate between combinational and sequential circuits.

(iii)   What is the significance of timing signals.

(iv)   Name any four shift microoperations.

(v)   Differentiate between direct and indirect addressing modes.

(vi)   Differentiate between internal interrupts and external interrupts.

(vii)   What is the function of control word?

(viii)   Draw the diagram of typical memory hierarchy in a computer.

(ix)   What is an omega network?

(x)   Describe parallel virtual machine.   (10×2=20)