15599

MCA 1st Semester Examination

Computer Architecture (CBS)

MCA-103

Time : 3 Hours   **Max. Marks : 60**

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

Note : Candidates are required to attempt five questions in all selecting one question from each of the sections A, B, C and D of the question paper and all the subparts of the question in section E.

SECTION - A

1. Define the following:

   (a)   Integrated circuits.

   (b)   Shift registers.

   (c)   Memory unit.

   (d)   Binary counters.   (4×3=12)

2. Write short notes on the following:

   (a)   Register transfer.

   (b)   Arithmetic loop.

   (c)   Logic loop.

   (d)   Shift loop.   (4×3=12)

SECTION - B

3. Discuss in detail the stack organization and explain how expressions are evaluated using stack organization.   (12)

4. Explain the various instruction formats for expression evaluation, using the following expression:

   $\varepsilon = A*B + C*D$ (12)

SECTION - C

5. Explain the following giving examples:

   (a)   Arithmetic pipeline.

   (b)   Instruction pipeline.

   (c)   RISC pipeline.   (3×4=12)

6. Design a 3-bit carry lookahead adder and determine the maximum number of gates between any input and each of the four outputs (3 sum bits and a carry).   (12)

SECTION - D

7. What do you mean by peripheral devices? Discuss briefly the purpose of any five peripheral devices.   (12)

8. What do you mean by parallel processing? What are the different types of parallel processors? Explain.   (12)

SECTION - E

9. Attempt all questions:

   (a)   What is a high impedance state?   (1)

   (b)   Define Micro-programmed control.   (1)

   (c)   Determine the number of clock cycles that it takes to process 200 tasks in a six segment pipeline.   (2)

(d) What is the difference between Hand Shaking and Strobe control? (1)

(e) What is a tristate logic? (1)

(f) What do you mean by interrupt cycle? (1)

(g) What are the overlapped windows? Discuss briefly. (1)

(h) What do you mean by priority interrupt? (1)

(i) What do you mean by associative memory? Explain the hardware organization of associative memory. (1)

(j) What is the transfer rate of an eight track magnetic tape whose speed is 120 inches per second and whose density is 1600 bits per inch? (2)