C0-R4.B4: COMPUTER SYSTEM ARCHITECTURE

NOTE:

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

Time: 3 Hours   **Total Marks: 100**

1.
a)   Find the result using 2's complement method 45 – 23.
b)   What is Cache Memory? What are its advantages and disadvantages?
c)   With the help of example, explain the steps to convert decimal number to equivalent binary number?
d)   Differentiate: Asynchronous data transfer & Synchronous data transfer
e)   How does parallel transmission is different from serial transmission?
f)   What are the differences between RISC & CISC architecture?
g)   Explain structural hazards with example.

(7x4)

2.
a)   Write short note on anyone:
    i)   Virtual Memory and
    ii)   Memory Management Hardware
b)   Design a hardware circuit to implement arithmetic shift operations. State your design specifications with truth table.
c)   Design circuit to add and subtract two signed 2's complement number.

(6+6+6)

3.
a)   Compare centralized memory architecture with distributed memory architecture.
b)   Discuss the different addressing modes of an instruction.

(8+10)

4.
a)   Perform binary multiplication of 14 X 5 using Booth's Algorithm.
b)   Write short notes on Handshaking method of data transfer.

(10+8)

5.
a)   With the help of a neat sketch, explain the working of a 4-bit universal shift register.
b)   Explain different methods used for establishing the priority of simultaneous interrupts.
c)   With neat block diagram, explain DMA data transfer.

(6+6+6)

6.
a)   Differentiate between single, general and stack register organization. Design circuit for general register organization.
b)   Describe: Instruction pipelining with suitable example.

(10+8)

7.
a)   Discuss different phases of instruction cycle.
b)   Discuss three different mapping schemes from cache memory to main memory.

(9+9)