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) What are the differences between memory mapped I/O and isolated I/O?

b) What is a software interrupt? Give example.

c) What are the differences between circular shift and arithmetic shift?

d) Draw flow chart for Booth Multiplication Algorithm.

e) A digital computer has a common bus system for 16 registers of 32 bits each. The bus is constructed with multiplexers. Write answer of following questions.

i) How many selection inputs are there in each multiplexer?

ii) How many multiplexers are there in a bus?

f) Which are the registers used in basic computer organization? Write are the contents of each register.

g) What is RISC? What are the advantages of it?

(7x4)

2.

a) What is instruction pipelining? What are the problems associated with it?

b) What are the general characteristics of Distributed Shared Memory? Write down the advantages and disadvantages of DSM.

c) What is handshaking? Explain source initiated transfer using handshaking.

(6+6+6)

3.

a) What are the various instruction formats of Basic Computers? Explain each.

b) What do you mean by Associative Memory? Draw the block diagram of associative memory giving its working.

(9+9)

4.

a) Draw and explain block diagram of RAM and ROM Chips. Explain how are they connected to microprocessor?

b) In a typical computer, paths must be provided to transfer information from one register to another. Draw the combinational circuit that transfers data from one 4-bit register to another 4-bit register using (i) multiplexer (ii) Tristate buffer.

(8+10)

5.

a) What is the use of Virtual Memory? Explain operation of Virtual Memory.

b) By using flow chart, explain how are Addition and Subtraction operation of signed magnitude performed in hardwired computer?

(9+9)

6.

a) During execution of instruction, the way the operands are chosen depends on addressing mode of instruction. Which are the modes of addressing? Specify effective address of operand for each addressing mode.

b) Draw and explain flowchart for Instruction execution cycle.

(9+9)

7.

a) DMA stands for Direct Memory Access. What are the modes of operation of data transfer using DMA? Explain each.

b) Draw and explain the combinational circuit for 2-bit by 2-bit array multiplier.

c) By taking a suitable example, explain evaluation of arithmetic expression using reverse polish notation.

(6+6+6)