

Roll No.

3152

**B. Tech. 3rd Semester (CSE-AI & ML)
Examination – December, 2022**

DIGITAL LOGIC AND COMPUTER ARCHITECTURE

Paper : PCC-CSE-251-G

Time : Three hours]

[Maximum Marks : 75

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt five questions in total selecting one question from each Section. Question No. 1 is compulsory.

1. (a) What a short note on Boolean algebra ?
- (b) Define Adder. Explain its types briefly.
- (c) In which addressing mode the address field is given in the definition of instruction ? Explain with example.
- (d) What do you mean by memory hierarchy ?
- (e) What is cache memory ? Why it is implemented ?
- (f) Define idle cycle of DMA. $2.5 \times 6 = 15$

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SECTION - A

2. (a) Define Multiplexer. Draw the circuit diagram of 4×1 multiplexer using logic gate and explain its working. 8
- (b) Draw the logic diagram of clocked RS flip-flop and explain its working. 7
3. (a) What is Demultiplexer ? Design the circuit diagram of $1 : 4$ De-Multiplexer using Inverters and three input AND gates. 8
- (b) Write the seven differences between combinational and sequential circuits in tabular form. 7

SECTION - B

4. Write short notes on :
- (a) Instruction formats 5 + 5 + 5
- (b) High performance arithmetic
- (c) Memory location and addresses
5. (a) Write a detailed note on floating point arithmetic with examples. 8
- (b) What are addressing modes ? Explain the various addressing modes with examples. 7

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SECTION - C

6. (a) Explain the different characteristics of Memory Systems. 10
- (b) Draw and explain direct mapped cache organization. 5
7. (a) Explain the different elements of cache design. 8
- (b) Explain virtual to physical address translation in virtual memory with the help of example. 7

SECTION - D

8. (a) Draw and explain the block diagram of I/O interface. 8
- (b) What is DMA and how it works ? 7
9. (a) What is Interrupt ? Explain the types of interrupts. 7
- (b) Explain the various I/O interfacing techniques. 8
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