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.　　　　$2.5 \times 6 = 15$

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 : **5 + 5 + 5**

   (a) Instruction formats

   (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**

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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