Total No. of printed pages = 3

19/3rd Sem/DCSE301

2021

COMPUTER ARCHITECTURE AND ORGANIZATION

Full Marks – 100

Time – Three hours

The figures in the margin indicate full marks for the questions.

Answer any *five* questions.

1. (a) Convert the number $(7654)_8$ to hexadecimal. 3

   (b) Explain with an example 32 bit floating point format. 3

   (c) Explain with example addition and subtraction using 2's complement. 4

   (d) Demonstrate the procedure for obtaining product-of-sums using k-maps. 10

[Turn over

2. (a) Design a 4-bit adder using four 1-bit adders. 4

(b) Define the following terms : 6

(i) Multiplexer

(ii) Decoder

(iii) ROM.

(c) Implement AND, OR, NOT gates using NAND gates. 10

3. (a) What is the purpose of addressing modes ? Explain the various addressing mode techniques. 10

(b) Explain Cache memory organization with Associative mapping. Explain how it improves the memory access time. 10

4. (a) Differentiate logical and physical address representations. 4

(b) How a computer instruction is executed ? Draw the instruction cycle. 10

(c) Distinguish between microprogrammed and hardwired control unit. 6

5. (a) Describe the internal structure of CPU with a block diagram. 10

(b) Illustrate with an example Booth multiplication algorithm. 10

6. (a) State the differences between RISC and CISC. 4

(b) With examples explain the Data transfer, Logic and Program Control Instructions. 6

(c) What is instruction format ? Discuss the different types of instruction formats. 10

7. Write short notes on : 20

(a) DMA

(b) Memory Hierarchy.