Reg. No. : | E | N | G | G | T | R | E | E | . | C | O | M |

## Question Paper Code : 50897

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024

Third Semester

Computer Science and Engineering

CS 3351 – DIGITAL PRINCIPLES AND COMPUTER ORGANIZATION

(Common to : Computer Science and Design / Computer Science and Engineering (Artificial Intelligence and Machine Learning) / Computer Science and Engineering (Cyber Security) / Computer and Communication Engineering / Artificial Intelligence and Data Science / Computer Science and Business Systems / Information Technology)

(Regulations 2021)

Time : Three hours                                          Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1.   What is combinational circuit?

2.   Which combinational circuit is otherwise known as data selector? Why?

3.   Write down the characteristic table of T flip flop.

4.   Compare Mealy and Moore Models.

5.   What is the difference between register addressing mode and register indirect addressing mode?

6.   What is data transfer instruction? Specify any two data transfer instructions.

7.   What is pipelining?

8.   Differentiate: Hardwired Control and Microprogrammed Control.

9.   Can a computer work without cache? Justify.

10.   What is the purpose of SATA?

PART B — (5 × 13 = 65 marks)

11. (a) Why do we need a code conversion? Explain with the conversion of binary to gray code.

Or

(b) Identify the combinational circuit that is used to compare the relative magnitude of two binary numbers. Construct the identified circuit for comparing 2-bit binary numbers.

12. (a) Which flip flop is called as data flip flop? Explain the operation of the same with its circuit diagram, characteristic table and excitation table.

Or

(b) Which counter is called decade counter? Why? Explain the operation of the same in asynchronous mode.

13. (a) Explain Von Neumann Architecture with neat sketch.

Or

(b) Describe any five addressing modes with examples.

14. (a) Draw a simple MIPS data path with control unit and explain the execution of ALU instruction.

Or

(b) Describe the methods for avoiding the control hazards.

15. (a) Explain in detail the memory hierarchy with neat diagram.

Or

(b) Explain in detail about Direct Memory Access (DMA) with neat diagram.

PART C — (1 × 15 = 15 marks)

16. (a) Design a Mod-5 Synchronous Counter using JK flip flop.

Or

(b) Design 8 × 1 MUX. Implement the following Boolean function using 8 × 1 MUX F (P,Q,R,S) = $\sum m\,(0,1,3,4,8,9,15)$.

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