

END TERM EXAMINATION

THIRD SEMESTER [BCA] JANUARY 2024

Paper Code: BCA-203

Subject: Computer Organization and Architecture

Time: 3 Hours

Maximum Marks: 75

Note: Attempt five questions in all including Q.No. 1 which is compulsory. Select one question from each unit.

- Q1 Attempt the following (any five) [5x5=25]
- What are logic gates? Draw the schematic diagram of XOR gate. Give its truth table.
 - Draw a MUX using NAND gates which selects from four inputs A0 to A3 and two select inputs S0 and S1.
 - What is the role of stack pointer in computer organization?
 - What is ROM? How PROM, EPROM and EEPROM differ from each other?
 - Design and explain Ring counter.
 - Explain the edge triggered D flip-flop.

UNIT-I

- Q2
- What are Universal gates? Explain how basic gates can be realized using NAND and NOR gates. [6.5]
 - State and prove Associative and Distributive theorems. [6]
- Q3
- Draw a full subtractor circuit using NAND gate. [6.5]
 - Minimise the following Boolean function using K-map. [6]
 $F(A, B, C, D) = \Sigma (3, 4, 5, 7, 9, 13, 14, 15)$

UNIT-II

- Q4
- Realize JK flip-flop using SR flip flop. [6.5]
 - Differentiate between flip-flop and latches. [6]
- Q5
- Describe the operation of PISO shift register with the help of block diagram. [6.5]
 - Differentiate Combinational and Sequential circuits? [6]

UNIT-III

- Q6
- What is instruction cycle? Draw detailed flowchart of the instruction cycle. [6.5]
 - What are CPU buses and Why they are important? [6]
- Q7
- Explain the different types of addressing modes in basic computer. [6.5]
 - What is a register in a CPU and How Does it Work? [6]

UNIT-IV

- Q8
- Write difference between Programmed Input /Output and Interrupt Driven Input/output. highest precedence [6.5]
 - How DMA controller communicates and transfers data between peripheral devices and RAM. low precedence [6]

P.T.O.

- Q9
- Draw and explain the memory hierarchy structure and mark the arrow from low to high (speed) and high to low (Cost). [6.5]
 - What is associative memory? Explain its working with the help of diagram. [6]

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P2/2