

The University of Burdwan
B.Sc. 4th Semester (General) Examination, 2022 (CBCS)
Subject: Computer Science
Paper: GE-4/CC-1D (Computer System Architecture)

Time: 2 Hours

Full marks: 40

The figures in the right hand margin indicate full marks.

Candidates are requested to give their answers in their own words as far as practicable.

A. Answer any 5 (five) questions:

5 x 2=10

1. State Demorgan's theorems in Boolean algebra.
2. State Principle of Duality.
3. Find 2's complement of : a) 10101 , b) 01110
4. Perform the subtraction: a) $(1010)_2 - (1000)_2$
5. What is flip-flop?
6. Compare between combinational and sequential circuit.
7. State the functions of Program Counter.
8. What do you mean by machine language?

B. Answer any 2 (two) questions:

2 x 5=10

1. State the truth table of full-subtractor. Implement full-subtractor using basic gates. (2+3)
2. Explain with examples: two-address instruction format & zero-address instruction format. 5
3. Simplify the expression $Y = m_1 + m_5 + m_{10} + m_{11} + m_{15}$, using K-map method. 5
4. Explain with example: 1's complement subtraction, and 2's complement subtraction. 5

C. Answer any 2 (two) questions :

2 x 10=20

1. Explain the different stages of an instruction execution using instruction cycle diagram. 10
2. Design a 3X8 decoder with basic gates. 10
3. State the following addressing modes with example: i) Register addressing mode, ii) Direct addressing mode, iii) Indirect addressing mode, iv) Implicit addressing mode, and v) Immediate addressing mode. (2+2+2+2+2)
4. Write short note on : i) DMA (Direct Memory Access) ii) Interrupt (5+5)
