(II) 09/10/2025

NEP - Semester End Examination – October 2025

Program: F.Y.BSc.CS SEM I **Course:** Digital System and Architecture

Program Code: UGCS02 **Course Code:** NUCS101

Duration: 1 Hour **Max. Marks:** 30

Instructions:

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Draw neat diagrams wherever necessary.

Q. 1		Attempt any TWO of the following.	[10]	Course Outcome	Knowledge Level
	(a)	Justify why NAND is called a universal gate by evaluating its ability to implement other logic gates.		CO1	L5
	(b)	Explain a Half adder with rules, truth table, description, and circuit diagram.		CO2	L2
	(c)	Design and draw the circuit of a D flip-flop and explain its working.		CO4	L6
	(d)	Construct 1:4 Demultiplexer (only circuit).		CO3	L1
Q. 2		**Attempt any TWO of the following.**	**[10]**	**Course Outcome**	**Knowledge Level**
	(a)	List and explain any two instructions of data transfer group.		CO1	L1
	(b)	Explain the flag register of a microprocessor with reference to either 8085 or 8086.		CO3	L2
	(c)	Explain addressing modes and illustrate any two with examples.		CO2	L3
	(d)	Construct and explain the architecture of a microprocessor (reference: 8085).		CO4	L6
Q. 3		**Attempt any TWO of the following.**	**[10]**	**Course Outcome**	**Knowledge Level**
	(a)	Differentiate between ADD and ADI & SUB and SUI instructions.		CO1	L1
	(b)	Solve the Boolean function $y = \sum m(1, 2, 3, 5, 6, 7, 11, 12, 13, 15)$ using K-map simplification.		CO2	L3
	(c)	Calculate the number of page hits and page misses for the given reference string using FIFO & LRU page replacement policies (frame size = 3) 2,3,2,1,5,2,4,5,3,2,5,2		CO4	L3
	(d)	Draw Half adder using multiplexer		CO3	L2

- - X - - X - -