University Institute of Engineering & Technology
(Recognised Under Section 2(f) and 12B of UGC)
Kurukshetra University, Kurukshetra

Roll No. - 25160125

THEORY EXAMINATION – DEC 2019		TIME – 3 Hrs.
B.TECH - ECE	**SEMESTER - III**	**M.M. - 75**

PAPER- EC-205	SUBJECT - DIGITAL ELECTRONICS

Note: All questions in Part-A and Part-B are compulsory. Attempt any four questions from Part-C selecting at least one from each unit.

PART-A (15 Marks)

Q. No. – 1 Answer the following questions.   15x1=15

(i)	Convert 01011111011.011111₂ to hexadecimal.
(ii)	Express -73.75 in 12 bit 2's complement form.
(iii)	Apply De-Morgan's Theorem to $\overline{[(A + B) + C]}$.
(iv)	Define the term fan out?
(v)	State Distributive law.
(vi)	Write Down differences between Demultiplexer and decoder.
(vii)	Give four examples of combinational circuits.
(viii)	Suggest a solution to overcome the limitation on the speed of an adder.
(ix)	Mention two differences between the edge triggering &level triggering.
(x)	Write the characteristic equation of a JK flip flop.
(xi)	Convert JK flip flop to T flip flop.
(xii)	A 4 bit binary ripple counter is operated with clock frequency of 1khz. What is the output frequency of its third flip flop.
(xiii)	What is propagation delay.
(xiv)	What is the difference between PAL & PLA?
(xv)	What s volatile and Non volatile memory.

	UNIT-I	
2	What is the importance and applications of Gray codes? Convert binary number 10100111 to gray code.	5

	UNIT-II	
3	Implement a full adder circuit using minimum number of NAND gates only.	5

	UNIT-III	
4	Draw the logic diagram and timing diagram of a 3 bit binary ripple up counter using positive edge triggered FFs.	5

	UNIT-IV	
5	What are the various types of ROM's? Discuss their relative advantages and disadvantages.	5

PART-C (40 Marks)

	UNIT-I	
6	(a) Add -31.5 to -93.125 using the 12-bit 2's complement arithmetic. (b) Perform subtraction of 27.8 from 57.6 using xs-3 arithmetic. (c) Design all the gates using only NAND gates.	(4) (3) (3)
7	Obtain the minimal SOP expression for $\Sigma m(0,1,2,3,5,7,8,9,10,12,13)$ & implement it in NAND logic.	10

	UNIT-II	
8	What is seven segment display? Discuss the circuit and working of a seven segment decoder.	10
9	What is a comparator. Discuss the circuit & working of a 2 bit comparator.	10

	UNIT-III	
10	Explain the operation of a 4 bit bidirectional shift register with the help of a circuit diagram.	10
11	(a) Draw the circuit of Master/slave JK flip flop and explain the operation of the circuit. (b) What do you mean by o's catching and i's catching phenomena in master/slave JK Flip Flop.	7 3

	UNIT-IV	
12	(a) Describe the working principle of R-2R ladder D/A converter. (b) Describe successive approximation ADC with suitable diagram.	5 5
13	What is PAL ? What are its application ? Discuss the design &working of a PAL.	10