

R16 Code No: 134CF

JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD B.Tech II Year II Semester Examinations, May - 2019 SWITCHING THEORY AND LOGIC DESIGN

(Common to EEE, ECE, MCT, ETM)

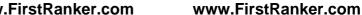
Time: 3 Hours Max. Marks: 75

Note: This question paper contains two parts A and B.

Part A is compulsory which carries 25 marks. Answer all questions in Part A.

Part B consists of 5 Units. Answer any one full question from each unit. Each question carries 10 marks and may have a, b, c as sub questions.

	PART - A	
		(25 marks)
1.a)	Perform the following conversions $(476.64)_{10} = ()_2 = ()_8$.	[2]
b)	Perform the following operation using 2's complement method $1111.10 - 0$	
c)	Define Multiplexer. Explain in brief about 2:1 Mux.	[2]
d)	Explain the procedure to construct the 3 variable K-map with an example.	[3]
e)	Derive the characteristic equations of D and T flipflop.	[2]
f)	Give the differences between latches and flipflops.	[3]
g)	Define state diagram.	[2]
h)	List the features of sequential circuits.	[3]
i)	What are finite state machines?	[2]
j)	List the limitations of finite state machines.	[3]
	70,	
	PART - B	
	0.0	(50 Marks)
2.	Design and realize the 3 bit binary to unit distance code using NOR gates.	[10]
	OR	
3.	Simplify and realize the following Boolean expression using logic gates.	
	a) Y=AB+A'C+BC	
	b) $Y = (A + B' + C')(A + B' + C)$	[5+5]
1.	Design a digital system to compare two binary numbers of 1 bit by using logic gates. [10] OR	
5.	Realize 3:8 maxterm generator using 2:4 maxterm generators. Using the sa	ame, Design a
	system to provide the difference of two numbers. Use external two input gat	es only. [10]
5.	Explain master slave JK flipflop with neat timing diagram.	[10]
	OR	
7.	Explain the principle of Universal shift Register(USR). Using the same,	_
	mod-8 twisted ring counter.	[10]





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- 8. Design a digital system using data flipflops to monitor the status of the bookrack of maximum occupancy 10. The number of books available in the bookrack on a daily basis for the following conditions over a week.
 - a) On Monday, there were 10 books.
 - b) On Tuesday, 2 books were removed and donated to near by library.
 - c) On Wednesday, one book is added to the bookrack.
 - d) Next day, 3 books were removed from the rack and given it to neighbour.
 - e) On Friday, one book was taken out for reading.
 - f) On Saturday, neighbour returned only two books.

All the remaining books were taken out on Sunday to clean the rack.

[10]

OR

- Discuss about the approaches of designing synchronous sequential finite state machines. 9.a)
 - Design a digital controller for the state table shown below using sequential component as single input data flip flop.

Present state	Next state, Output(z)	
	Input(x)=0	Input(x)=1
A	C,0	B,1
В	D,0	D,0
С	C,1	A,0
D	A,1	A,0

Draw the state diagram of a Mealy machine that produces a 1 output if there have been 10. four or more consecutive 1 inputs or two or more consecutive 0 inputs.

OR

- With a neat block diagram, explain the moore model of a clocked synchronous sequential 11.a) circuit.
 - b) Illustrate partition techniques in sequential circuits.

[5+5]