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Department of Computer Science and Engineering

B. Sc. in Computer Science and Engineering

Semester Final Examination 2016 (Jul-Dec)

Level 4 Semester II, Course Code: CSE 457, Credit: 3.0

Course Title: VLSI Design

Time: 03 Hours

Total Marks: 90

[N.B. The figure in the right margin indicates the marks allocated for respective question. Split answer of any question will not be accepted.]

<u>SECTION-A</u>
(Answer any threefrom the following questions.)

	(0)	Describe VLSI IC family. Describe the necessities of VLSI IC family.	5
1.	(a)	Define bipolar and MOS technology. Discuss p and n channel MOSFET.	2+3
	(b)	Define bipolar and MOS technology. Discuss p and n chamber	5
	(c)	Compare among BiCMOS, CMOS and bipolar technology.	
2.	(a)	Mention the rules of nMOS stick diagram design style.	3
۷.	(ω)	Mention the guidelines to design a VLSI system. Discuss about stick diagram in	2+3
	(b)	Mention the guidelines to design a vest system a vest detail.	
	<i>(</i> -)	Briefly discuss about nMOS flabrication.	7
	(c)	Briefly discuss about inview income	
		10	1+2
3.	(a)	What is E-beam masking and why is it used?	
	(b)	Explain CMOS stick diagram design style with an example.	.5
	(c)	Derive the drain to source current I_{ds} versus voltage V_{ds} relationship equations for	7
	(0)	the non-saturated region as well as the saturated region.	
1	(a)	Determine the pull-down ratio Zp.u./Zp.d. for an inverter driven by another nMOS	5
4.	(a)	inverter.	
	(b)	Discuss the operational procedure of a typical multiplexer and then design it	5+5
	(0)	through stick diagram using pass transistor switch logic.	

SECTION-B

(Answer any three from the following questions.)

1.	(a)	Diagram	
		Discuss about pass transistor and switch logic for VLSI design.	5
	(b)	What is transmission gate? Discuss regularity factor of a design with an example. Draw and discuss the exist.	3
	(c)	Draw and discuss the stick diagram of CMOS inverter.	5
		and strok diagram of CMOS inverter.	5
2.	(a)	What are the necessities of transistors in VLSI design? Discuss the Lambda based design rules for stick diagram.	2+2
	(b)	Show the basis of the same of	212
		Show the basic circuit of BiCMOS inverter and describe its operating principle.	_
	(c)	Discuss the full adder. Draw its stick at	2+3
		Discuss the full adder. Draw its stick diagram using multiplexer based switch logic.	3+3
3.	(a)	Show the stick diagram (outline) of a 4-bit adder.	
	(b)	Discuss the bus orbit.	3
	(c)	Discuss the bus arbitration logic for n-line bus in favor of VLSI design.	3
	(-)	Discuss the operational procedure of a typical parity generator and then draw its	4
		generator and then draw its	4+4
4.	(a)	Illustrate the subsystems of a typical ALU.	
	(b)	Discuss charge stores.	
	(c)	Discuss charge storage and dynamic memory element in context of VLSI design. ALLIE OF	3
	(=)	How can a 4-bit adder be used for implementing the logical operations of a 4-bit ALU? Show the stick diagram (outline) of the 4-bit ALU.	2+2
		ALU? Show the stick diagram (outline) of the 4-bit ALU.	4+4