INSTITUTE OF AERONAUTICAL ENGINEERING

(Autonomous)

Dundigal, Hyderabad - 500 043

ELECTRONICS AND COMMUNICATION ENGINEERING

ASSIGNMENT

Course Name	:	**SWITCHING THEORY AND LOGIC DESIGN**
Course Code	:	A30407
Class	:	II - B. Tech
Branch	:	ECE
Year	:	2015 – 2015
Course Coordinator	:	Mr B.Naresh
Course Faculty	:	Mr D.Loknath Reddy

OBJECTIVES

To meet the challenge of ensuring excellence in engineering education, the issue of quality needs to be addressed, debated and taken forward in a systematic manner. Accreditation is the principal means of quality assurance in higher education. The major emphasis of accreditation process is to measure the outcomes of the program that is being accredited.

In line with this, Faculty of Institute of Aeronautical Engineering, Hyderabad has taken a lead in incorporating philosophy of outcome based education in the process of problem solving and career development. So, all students of the institute should understand the depth and approach of course to be taught through this question bank, which will enhance learner's learning process.

S. No	Question	Blooms Taxonomy Level	Course Outcome
	ASSIGNMENT-I **UNIT-I** **NUMBER SYSTEM AND BOOLEAN ALGEBRA AND SWITCHING FUNCTIONS**		
1.	Convert the following to Decimal and then to Hexadecimal, octal, binary (i) 744_8 (ii) 1552_8(iii) 11011001_2 (iv) 11110011_2	Understand	1
2	Perform the subtraction with the following unsigned binary numbers by taking the 2's complement of the subtrahend: i. 100 – 110000 ii. 11010 - 1101.	Understand	1
3	Convert the following numbers: i. 10101100111.0101 to Base 10 ii. (153.513)10 = ( )8	Understand	1
4	Obtain the gray code equivalent of the Hex Number 3A7	Understand	1
5	Obtain the binary of number code for the decimal numbers from 0 to 9	Apply	1
6	Examine (72532 - 03250) using 9's complement.	Understand	1
7	Simplify to a sum of 3 terms: A'B'C' +ABD+A'C +A'CD' +AC'D + AB'C'	Apply	3
8	Find the possible terms which could be added to the expression using the consensus theorem. Then reduce to a minimum SOP A'C'D' + BCD + AB'C' +A'BC	Apply	3

S. No	Question	Blooms Taxonomy Level	Course Outcome
9	State and prove any 4 Boolean theorems with examples	Remember	2
10	Simplify to a sum of 3 terms: A'C'D' +AC' +BCD + A'CD' + A'BC + AB'C'	Apply	3
11	How do you convert a2 level OR-AND circuit into an AND-NOR circuit.	Understand	4
	UNIT-II **MINIMIZATION AND DESIGN OF COMBINATIONAL CIRCUITS**		
1	For the function T(w,x,y,z)= ∑(0,1,2,3,4,6,7,8,9,11,15): Find all prime implicants and indicate which are essential through the Kmap	Apply	5
2	Using the maps method, simplify the following expression using sum of the product from. (abc)'+a(bc)' +don't cares abc+a'bc'+a'b'c	Understand	5
3	Derive the Boolean algebra expression for a getting network that will have outputs 0 only when X=1, Y=0, Z=0. The outputs are to be 1 for all other cases.	Apply	5
4	Let f =∑ (5,6,13) and f1=∑(0,1,2,3,5,6,8,9,10,11,13). Determine f2 such that f=f1 x f2'.	Apply	5
5	A combinational circuit has 4 inputs(A,B,C,D) and three outputs(X,Y,Z)XYZ represents a binary number whose value equals the number of 1's at the input: i. Find the minterm expansion for the X,Y,Z ii. Find the maxterm expansion for the Y and Z	Apply	6
6	Explain how you design a combinational circuit. Show a combinational circuit for a Binary multiplier.	Understand	6
7	Implement Half adder using 4 NAND gates	Understand	6
8	Implement full substractor using NAND gates only.	Knowledge & remember	6
9	Design a circuit with four inputs and one output where the output is 1 if the input is divisible by 3 or 7.	Apply	6
10	Design a circuit with three inputs(A,B,C) and two outputs(X,Y) where the outputs are the binary count of the number of "ON" (HIGH) inputs	Apply	6
	UNIT-III **SEQUENTIAL MACHINES FUNDAMENTALS**		
1	Analyze the clocked sequential circuits.	Understand	7
2	Examine with the help of a block diagram, the basic components of a Sequential Circuit?	Remember	7
	ASSIGNMENT-II **UNIT-III** **SEQUENTIAL MACHINES FUNDAMENTALS**		
1	Compare RS and JK flip-flops.	Understand	7
2	Describe about T – Flip-flop with the help of a logic diagram and characteristic table. Derive a T-flip-flop from JK and D flip-flops.	Understand	7
3	Define Latch. Explain about Different types of Latches in detail	Remember	7
4	Explain about all flip flops in detail with diagram	Remember	7
5	Derive the characteristic equations for all Flip-Flops.	Remember	7
6	Memorize about the basic macro cell logic with diagram.	Remember	7
7	Differentiate combinational and sequential circuits	Understand	7
8.	Explain the working principle of JK Flip-Flop in detail.	Understand	7
	UNIT-IV **SEQUENTIAL CIRCUIT DESIGN AND ANALYSIS**		
1	Memorize the design of Sequential circuit with an example. Show the state reduction, state assignment.	Remember	8
2	Examine the analysis of clocked sequential circuits	Remember	8
3	Explain the state reduction and state assignment in designing sequential circuit. Consider one example in the above process	Understand	8

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4	Design a sequential circuit with two D i/p-o/p s A and B. and one input x. when x=0, the state of the circuit remains the same. When x=1,the circuit goes through the state transition from 00 to 11 to 11 to 10 back to 00.and repeats	Apply	8
5	Explain about Serial Transfer in 4-bit shift Registers	Remember	8
6	Explain about Binary Ripple Counter	Remember	8
7	Describe about BCD Counter and Draw its State table for BCD Counter?	Remember	8
8	Analyze about 4-bit Universal Shift Registers?	Apply	8
9	Design a Modulo-12 up Synchronous counter Using T-Flip Flops and draw the Circuit diagram?	Apply	8
10	Explain the Ripple counter design. Also decade counter design.	Understand	8
UNIT-V SEQUENTIAL CIRCUITS & ALGORTHMIC STATE MACHINES			
1	Explain the difference between asynchronous and synchronous sequential circuits	Understand	9
2	Define fundamental-mode operation	Understand	9
3	Compare between stable and unstable states	Apply	9
4	Differentiate between an internal state and a total state?	Apply	9
5	Describe about latch excitation table	Understand	9
6	Describe about Merging of flow tables	Understand	9
7	Discuss about Transition table and output map	Understand	9
8	Explain about Maps for Latch inputs.	Remember	9
9	Find the circuit that has no static hazards and implement the Boolean function for the following F(A,B,C,D) = (0,2,6,7,8,10,12)	Remember	9
10	An Asynchronous sequential circuit is described by the following excitation and output function. Y=x1x2'+(x1+x2')y and Z=Y a) Draw the logic diagram of the circuit. b) Derive the transition table and output map. c) Obtain a 2-state flow table	Apply	9

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