	MANIPAL INSTITUTE OF TECHNOLOGY Manipal University
	FIRST SEMESTER M.Tech. (INDUSTRIAL AUTOMATION AND ROBOTICS) DEGREE END SEMESTER EXAMINATION December 2015 /January 2016 SUBJECT: ANALOG AND DIGITAL ELECTRONICS (MTE-505)
]	TIME: 3 HOURS MAX. MARKS: 50
Ins	<ul> <li>tructions to candidates</li> <li>Answer ANY FIVE full questions.</li> <li>Missing data may be suitably assumed.</li> </ul>
A.	Convert 10110101101 to: (a) Decimal (b) Hexadecimal (c) Octal
IB.	Design a combinational logic circuit to convert 8421 code to 2421 code.
	(5+5)
2A.	Reduce the following two expressions using Boolean Algebra. i. $xy + x^2z + yz$ ii. $(x+y)(x^2+z)(y+z)$ For the two expressions given below, use K men method to find the equivalent SOP forms
2D.	i. $F(A, B, C, D) = \sum m (1, 4, 5, 6, 12, 13, 14, 15)$ ii. $G(A, B, C) = \pi M (0, 3, 6, 7)$ (5+5)
3A.	How can a JK flip flop be derived from a D flip flop? Further explain how a T flip flop can be derived from a JK flip flop. Use suitable diagrams to illustrate the same.
3B.	Analyze the sequential circuit given in Fig Q 3B.
	(5+5)
IA.	Differentiate between Ring counter and Johnson counter. Support your answer with suitable illustrations.

Reg. No.

4B. With a suitable illustration explain the operation of a Differential amplifier.

(5+5)

- 5A. Write short notes on : (a) Peak detector (b) Clipper
- Show the status of CY, AC and P flags after the addition of 88H and 93H in the following 5B. instructions:

MOV A, #88H ADD A, #93H

1A. 1B.

2A.

2B.

3A.

3B.

4A.

(5+5)

- 6A. Describe the structure of the program status word register in 8051 using a suitable diagram.
- 6B. Elaborate on the most commonly used registers in 8051 microcontroller.

(5+5)



Figure Q 3B