

MANIPAL INSTITUTE OF TECHNOLOGY

THIRD SEMESTER B. TECH. (INSTRUMENTATION AND CONTROL ENGG.) END SEMESTER DEGREE EXAMINATIONS, NOVEMBER - 2018

SUBJECT: DIGITAL ELECTRONIC CIRCUITS [ICE 2103]

TIME: 3 HOURS MAX. MARKS: 50		50
Instructions to candidates		
	Answer ALL questions.	
	Missing data may be suitably assumed.	
1 4		23.6
IA	Minimize the following output function using K-map.	3M
	$\Sigma m(0, 1, 2, 3, 4, 6, 8, 9) + d(10, 11)$	
1B	Using the tabular method, obtain the minimal expression for $\Sigma m(6, 7, 8, 9) + d(10, 11, 13, 14, 15)$	4M
1C	Design a 4:1 multiplexer using 2:1 multiplexers.	3M
2A	Design a circuit to detect the decimal numbers 0, 1, 4, 6, 7 and 8 in 4-bit XS-3 code input.	3M
2B	Define the various flip-flop characteristics with neat timing diagrams.	4M
2C	List the difference between synchronous and asynchronous sequential circuits.	3M
3A	Design a type D counter that goes through states 0, 1, 2, 4, 0, 1, 2 The unused states must always go to zero on the next clock pulse.	5M
3B	Design a clocked sequential circuit with a single input x and single output z which produces an output $z = 1$ whenever the input x completest the sequence 1101 and overlapping is allowed.	5M
4A	Explain the workings of serial shift registers with neat diagrams.	3M
4B	Explain the working of a Johnson counter with neat logic diagram, timing diagram and the count table.	3M
4C	Design a Mod-6 Asynchronous counter using T flip-flops.	4M
5A	Explain hazards in combinational circuits.	4M
5B	Explain PAL architecture in detail.	3M
5C	Show how the PLA circuit can be programmed to implement sum and carry outputs of a full adder.	3M
