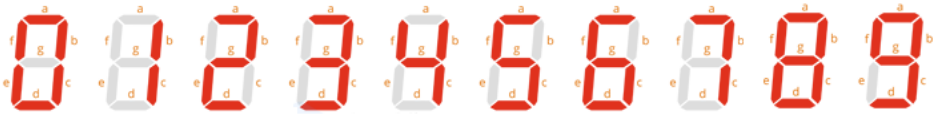
MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

THIRD SEMESTER B. TECH (ELECTRONICS AND INSTRUMENTATION)
PROCTORED ONLINE END SEMESTER EXAMINATION Jan. 22
SUBJECT: **DIGITAL ELECTRONIC CIRCUITS** (ICE 2152)
TIME: 9:00AM – 12:00PM **DATE: 29-01-2022** **MAX MARKS: 20**

Note: Answer All questions.

1	A	Explain Digital IC specification using a neat diagram.	2M
	B	Design a circuit using AOI logic which outputs a 1 when a 4-bit BCD code translated to a number that uses the lower right segment of a 7-segement display. 	3M
	C	Design a synchronous counter using D flip flops that counts 2, 3, 5, 7, 10, 12, 14 .. . The unused states of the counter change to 6 at the next clock pulse.	5M
2	A	An asynchronous sequential circuit is described by the following excitation and output functions. $Y = x_1\overline{x_2} + (x_1 + \overline{x_2})y$ $z = y$ Draw the logic diagram of the circuit. Also derive the transition table and output map.	2M
	B	Implement the following logic function using a 4:1 mux: $F(A,B,C,D) = \sum m(1,3,4,11,12,13,14,15)$	3M
	C	A clocked sequential circuit with single input x and single output z produces an output z = 1 whenever the input x completes the sequence 1001 and overlapping is allowed. Obtain the state diagram and design the circuit with D flip flops for a Moore type sequence detector.	5M