DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Winter Examination – 2022

Course: B. Tech. **Branch : Electronics Engineering** **Semester :V**

Subject Code & Name: [BTEXOE505A] Digital System Design

Max Marks: 60 **Date:14/02/2023** **Duration: 3 Hours**

Instructions to the Students:

1. *All the questions are compulsory.*
2. *The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.*
3. *Use of non-programmable scientific calculators is allowed.*
4. *Assume suitable data wherever necessary and mention it clearly.*

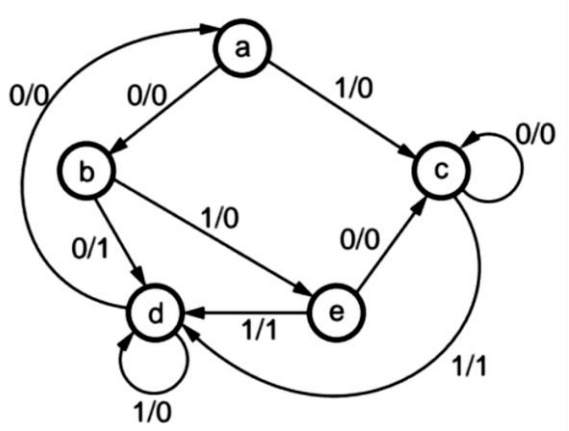
		(CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	**Explain any four data objects in VHDL with syntax.**	CO1	**6**
B)	**Explain Design flow for Digital System Design using VHDL.**	CO1	**6**
C)	**Explain the following sequential statements with Syntax:** **if statement** **next** **exit** **return** **loop** **case**	CO2	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**What is test bench in VHDL and write test bench code for 4:1 MUX.**	CO2	**6**
B)	**Explain attributes in VHDL with example.**	CO2	**6**
C)	**Write a short note on configuration.**	CO2	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	**Design Octal to Binary Encoder and write VHDL code.**	CO1	**6**
B)	**Design full subtractor and write VHDL code using dataflow modeling.**	CO1	**6**
C)	**Design 8 to 1 Multiplexer and write its VHDL code.**	CO1	**6**

Q.4 Solve Any Two of the following. **12**

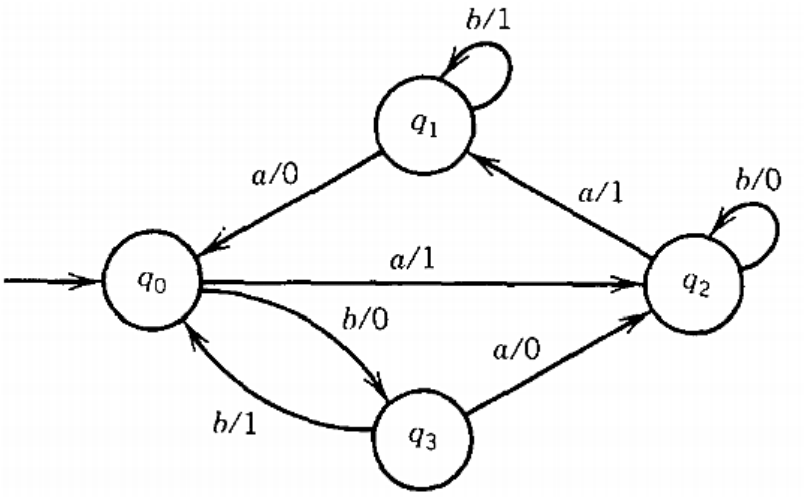
A) What is a state assignment in Finite State Machine? Draw the state diagram from the following state table. CO2 **6**

Present state	Input x=0		Input x=1	
	Next state	Output	Next state	Output
q1	q1	0	q2	0
q2	q2	1	q3	0
q3	q2	0	q3	1

B) Reduce the following State diagram and prepare a State table for the reduced State diagram CO2 **6**



C) Convert Mealy machine to Moore machine from the following diagram. CO2 **6**



Q. 5 Solve Any Two of the following. **12**

A) Write a short note on place & route process. CO2 **6**

B) Write a short note on ROM. CO2 **6**

C) Write a short note on Programmable Logic Array (PLA). CO2 **6**

***** End *****