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Semester V (B.Tech)

Er. No. 211B083...

Academic Year: 2023-24

Jaypee University of Engineering & Technology, Guna

T-2(Odd Semester 2023)

18B11CI511 – Theory of Computation

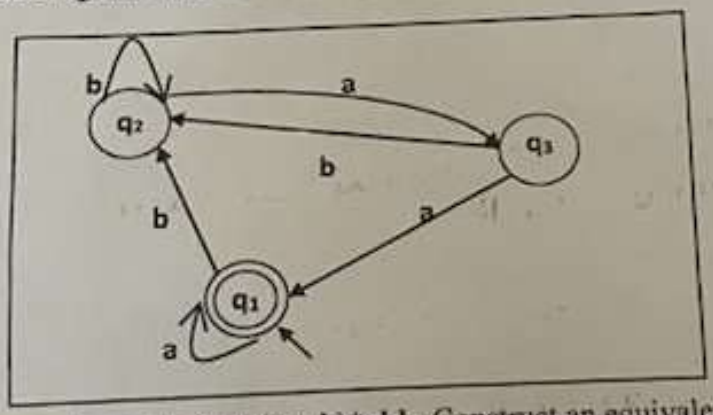
Maximum Duration: 1 Hour 30 minutes

Maximum Marks: 25

Notes:

1. This question paper has *five* questions.
2. Write relevant answers only.
3. Do not write anything on question paper (Except your Er. No.).
4. Marks are indicated in the square bracket

			Marks	CO No.
Q1.	**(a)**	Show that $G_1 = (\{S\}, \{a, b\}, P_1, S)$, where $P_1 = \{S \rightarrow aSb \mid ab\}$ is equivalent to $G_2 = (\{S, A, B. C\}, \{a, b\}, P_2, S)$, Here P_2 consists of: $S \rightarrow AC$, $C \rightarrow SB$, $S \rightarrow AB$, $A \rightarrow a$, $B \rightarrow b$.	[03]	CO2
	(b)	Construct a regular grammar G over {a, b} for $L(G) = \{a^n b^m : n \geq 1, m \geq 0\}$	[02]	CO4
Q2.		Construct a regular expression corresponding to the automata given below:	[05]	CO3



Q3.		Consider regular expression **(a + b)*abb**. Construct an equivalent		CO4
	(a)	NFA with null- moves	[02]	
	(b)	Convert machine constructed in (a) into NFA without null moves	[02]	
	(c)	Convert machine constructed in (b) into DFA.	[02]	
Q4.		Using the pumping lemma, prove or disprove that the following set is not regular: $\{a^n b^{2n} \mid n > 0\}$	[04]	CO2
Q5.		Reduce the following grammar to Chomsky normal form: **S → ASA, S→bA, A→B, A→S, B→c**	[05]	CO3