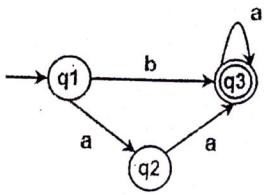
Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058, India
(Autonomous College Affiliated to University of Mumbai)

MSE Examination
October 2022

Max. Marks: 20 | Duration: 1hr.
Class: T.E. (V) Computer/IT | Course Code: CS301/IT301
Name of the Course: Theory of Computation

Instructions:
(1) All questions are compulsory
(2) Draw neat diagrams
(3) Assume suitable data if necessary

Q. No.		Max Marks	CO-BL-PI
Q 1)	Design a DFA over alphabet $\sum = \{0, 1\}$, which accepts the set of strings that either start with 01 or end with 01.	5	1-3-1.1.1
Q.2 a)	Construct the regular expression over alphabet $\sum = \{a, b\}$, in which no two 'a' and no two 'b' should come together. Justify your answer.	2	1-3-1.1.1
b)	Find the regular expression for the following FA using Arden' theorem 	3	1-3-1.1.1
Q. 3 a)	Consider the following productions of Context Free grammar. S is a start symbol. S → XbbaaX | aX X → Xa | Xb | ϵ Construct leftmost and rightmost derivation of 'abaabb' and Parse Tree.	3	3-3-1.1.1
b)	Describe in words the language generated by the following grammars. S→bS |a	2	3-3-2.2.3
Q. 4)	Find CNF equivalent to: S→ qP | rT P→ qqP |rS |r T→rTT | qS |q	5	3-3-1.2.2