

Anjuman Islam Janjira Degree College of Science Murud-Janjira, Raigad-402401 Affiliated to University of Mumbai	
Class: -S.Y.B.Sc C.S	Subject: - Theory Of Computation
Semester:- III Additional Exam	Course code: -Major
Exam Event:- FH Summer 2026	Marks: -30
Date: - 20-02-2026	Duration: - 01:00 Hours

N.B. –

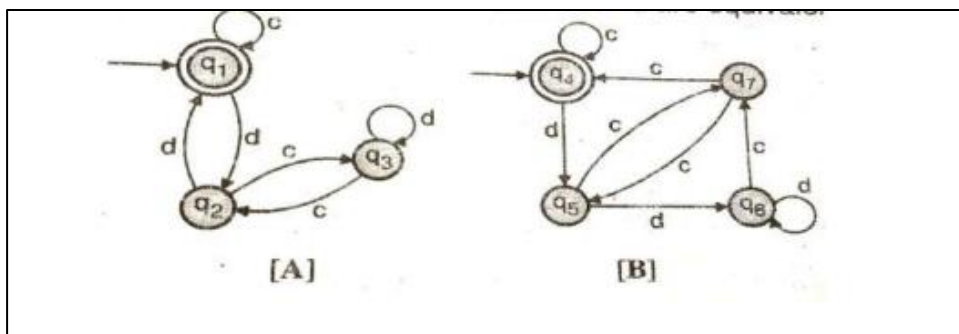
- 1 – All questions are compulsory.
- 2 – All questions have internal choice.
- 3 – Figures to the right indicate full marks.



Q1. Answer the following question (2 out of 4)

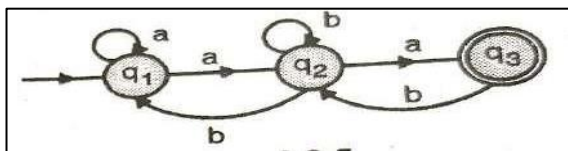
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1. Check the two automate equivalent or not.



and define grammar.

2. Consider a transition system given in the system the fig prove that the given string organize by



3. Using pumping lemma. Prove that the language $A = \{a^n b^n | n \geq 0\}$ is not regular.
4. Explain Chomsky Classification of grammar.

Q2. Answer the following question (2 out of 4)

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1. Convert the following CFG to GNF p: $s \rightarrow AsA | aB$, $A \rightarrow B | \epsilon$, $B \rightarrow b | \epsilon$
2. Explain Halting problem & Prove $ATM = \{(M, W) \mid \text{The TM } M \text{ halts on inputs on } w\}$ is undecidable.
3. Design TM which can accept language 0^*1^* .
4. Construct a PDA that accepts $L = \{0^n 1^n \mid n \geq 1\}$. Define PDA tuples?

Q3. Answer the following question. (2 out of 4)

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1. Define pumping lemma for CFG. state & explain PL for CFG.
 $uvwx \leq n - 2) \mid vx \geq 1 \quad 3) \text{ For all } i \geq 0 \quad uv^iwx^iy \in L$
2. Convert the following to GNF p: $S \rightarrow XA | BB$, $B \rightarrow b | sB$, $X \rightarrow b$, $A \rightarrow a$
3. What is Automata. & its Characteristics. State & explain moore machine.
4. State and explain Arden's theorem.
 Prove that $(1+00^*1)^+ (1+00^*1) (0+10^*1) (0+10^*1)$ to equal to $0^*1(0+10^*1)^*$