Or

1. (a) Construct a Minimum State Automation equivalent to an Automation whose transition table is defined in Table (ii) 8

| State | a | b |
|---|---|---|
| $\rightarrow q_0$ | $q_1$ | $q_2$ |
| $q_1$ | $q_1$ | $q_3$ |
| $q_2$ | $q_3$ | $q_4$ |
| $q_3$ | $q_1$ | $q_5$ |
| $q_4$ | $q_4$ | $q_2$ |
| $(q_5)$ | $q_6$ | $q_6$ |

Table - 2

(b) Prove that for any transition function ä and for any Input string x & y ä (q, xy) = ä (ä (q, x),y) 8

## Unit - II

2. (a) Prove the following identity

$(1+00^*1) + (1+00^*1)(0+10^*1)(0+10^*1) = {}^{0*}1\ (0+10^*1)$ 6

(b) Construct the finite Automation equivalent to Regular Expression

$(0+1)^*\ (00+11)\ (0+1)^*$ 10

Or

2. (a) By using Pumping Lemma, show that

$L = \{a^p \mid P \text{ is Prime }\}$ is not regular 6

(b) Prove the following :

(i) If L & m are Regular languages, then L-m is also Regular language. 5

(ii) If L is a Regular languages, then $L^R$ is also Regular language. 5