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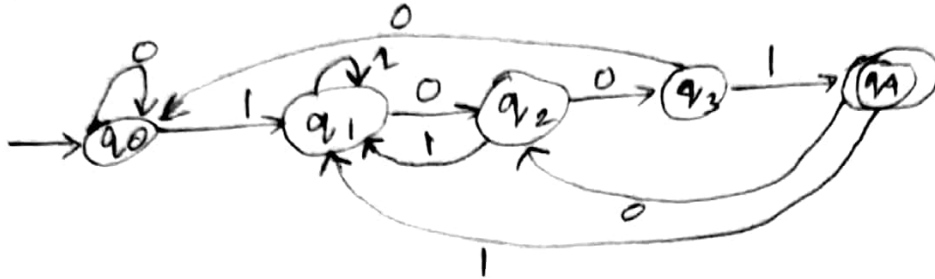
Matric NO: A20 M74005

Assignment: 4

① Regular expression for the given language = $(1+0)^*1001$

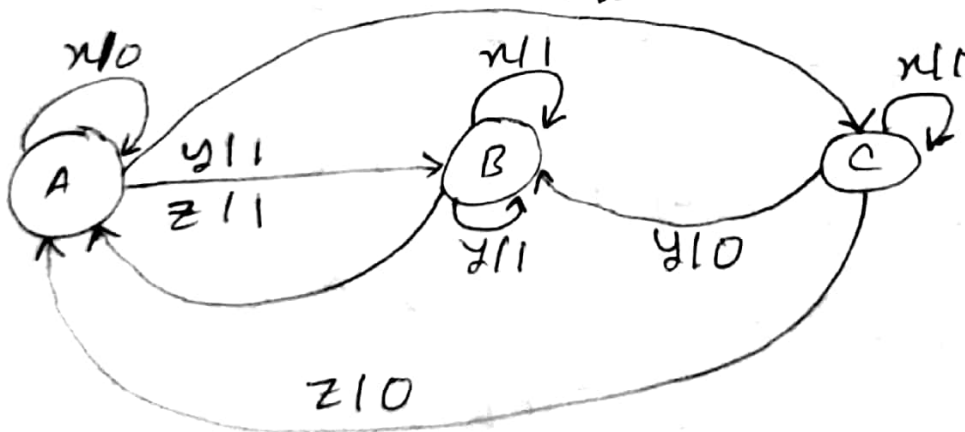
The strings of language = $\{1001, 11001, 101001, 1001001, \dots\}$

DFA For Language -



②

(i) Transition Diagram -



(II) output for the input string $x y z x$

$$\delta(A, x y z x) \xrightarrow{\text{output}} (A, y z x)$$

$$\delta(A, y z x) \xrightarrow{1} (B, z x)$$

$$\delta(B, z x) \xrightarrow{1} (B, x)$$

$$\delta(B, x) \xrightarrow{1} (A, \epsilon)$$

$$\delta(A, \epsilon) \xrightarrow{0} A$$

Output = 0110

(III) output for string $z x y z$

$$\delta(A, z x y z) \xrightarrow{\text{output}} (C, x y z)$$

$$\delta(C, x y z) \xrightarrow{0} (C, y z)$$

$$\delta(C, y z) \xrightarrow{0} (B, z)$$

$$\delta(B, z) \xrightarrow{1} (B, \epsilon)$$

$$\delta(B, \epsilon) \xrightarrow{1} (A)$$

Output = 00011

(IV) String $znynz$ -

$$\delta(A, znynz) \vdash (C, nynz)$$

$$\delta(C, nynz) \vdash (C, ynz)$$

$$\delta(C, ynz) \vdash (B, nz)$$

$$\delta(B, nz) \vdash (B, z)$$

$$\delta(B, z) \vdash A$$

Therefore string $znynz$ is accepted by DFA