

## Marking Scheme & Partial Solutions:

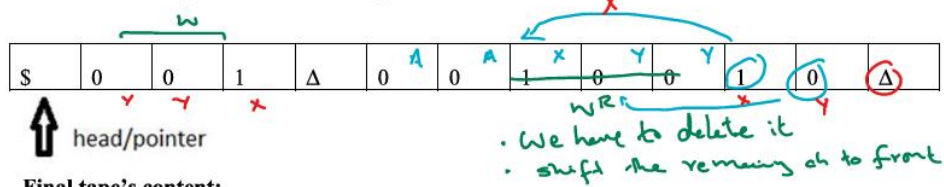
**CLO #4: Differentiate and manipulate formal descriptions of languages, automata, and grammars with a focus on non-context-free languages using Turing Machines**

### Question#5: Dry Run Turing Machine

[marks 20]

Perform a dry run of the single-tape Turing machine on the next page and provide the tape's final content after the machine halts. Additionally, describe the machine's function or purpose.

The initial configuration of the TM is given below.



Final tape's content:

*Final Output:*

\$	0	0	1	Δ	0	0	1	0	Δ	Δ	Δ	-	-	-
----	---	---	---	---	---	---	---	---	---	---	---	---	---	---

*↑ pointer location.*

Also mark where will be the head pointer.

Working (be brief and to the point)

*\* w ≠ y such that if y contain wR as a subset then we have to erase it & shifts the remaining characters toward left.*

### Marking Scheme

#### For 5 Marks

\$	Y	Y	X	^	A	A	X	Y	Y	1	0
----	---	---	---	---	---	---	---	---	---	---	---

#### For 8-10 Marks

\$	0	0	1	^	A	A	1	0	^	^	^
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#### For 12 Marks

\$	Y	Y	X	^	A	A	X	Y	^	^	^
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#### For 14 - 15 Marks (if marker is correct then +1 Marks)

\$ [Pointer]	0	0	1	^	0	0	1	0	^	^	^
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#### 4 Marks for Guessing Functionality of the TM