Q. 1 Show that (single-tape) Turing machines that cannot write on the portion of the tape containing the input string recognize only regular languages. (6 points)
(Your proof may be informal, but it must be sensible)

TM's have memory and counting capability, while DFA's don't have. To memorize, TM's use special tape symbols and write on tape containing input. So, already read portion of tape is recognized. Machine can reach back to a marked position. So, we know where the head was last time. When we restrict the TM's to change anything on tape containing input, no marker can be put on tape. So, no counting or memorization exists.

What such tapes can do in this situation?
They start reading input but can't remember what they had read before. This is the exact property which DFA's hold. Even PDA's can remember in a limited fashion, but such TM's can't remember any thing. So, they also don't accept CFL's. Hence, they are equivalent to DFA's, and can recognize only regular languages.

Q. 2 Are recursive Turing Machines and recursively enumerable Turing Machines equivalent? Briefly and precisely justify your answer. (3 points)

They are not equivalent. Recursive TM's can accept or reject only on a particular input, while recursively enumerable TM's can accept, reject or loop forever.
(There are also many other differences of properties).

Q. 3 True or False? (1 point)
The set of all possible Java programs forms a regular language. False