Q3. Waveform analysis is mentioned in the attached waveform.png

Q4. The key difference between asynchronous and synchronous RAM lies in the presence of a clock signal and feedback logic.

- In asynchronous RAM, the circuit is purely combinational, meaning that any change in the input leads to an immediate change in the output. The output is evaluated at all times. For combinational circuits, the sensitivity list has all of the inputs.
- Synchronous RAM requires a clock event (either a rising or falling edge) for the output to change. The output is evaluated only at this clock event and not in between. Additionally, the designer can choose between a synchronous or asynchronous reset. A synchronous reset only resets the output when a clock event occurs, whereas an asynchronous reset causes the output to reset immediately, regardless of the clock. For synchronous RAM, the sensitivity list will only have a clock(and async reset).