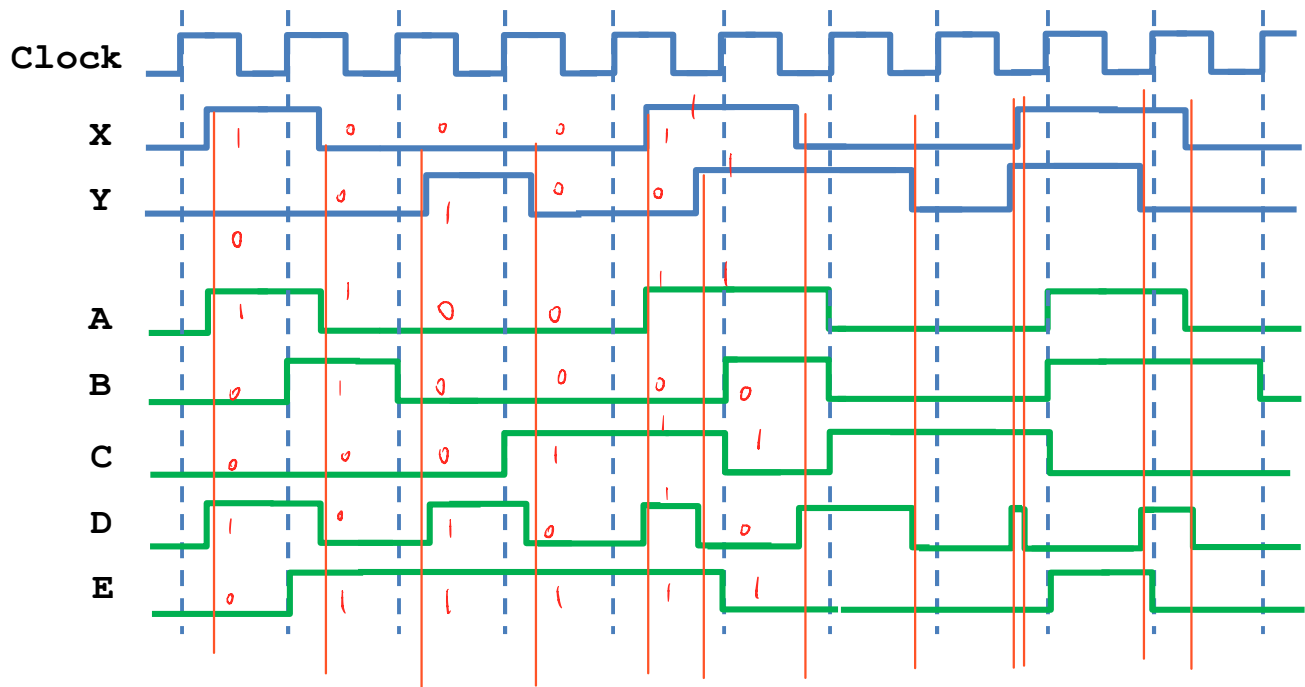# Part E: Sequential Circuits (18 marks)

1. The waveform diagram below illustrates the output behaviour of five devices in response to inputs X, Y and the clock. Based on the output behaviour of A, B, C, D and E (marked in green), Indicate in the spaces provided the gate or device caused these output waveforms. **(10 marks)**

A: ___D latch X___

B: ___D flip-flop X___

C: ___T flip-flop Y___

D: ___XOR___

E: ___T flip-flop X___

2. In the waveform diagram below, show what the waveform looks like for the signals in the flip-flop circuit on the right. Assume that Q_0 and Q_1 each start with initial values of 0. **(8 marks)**