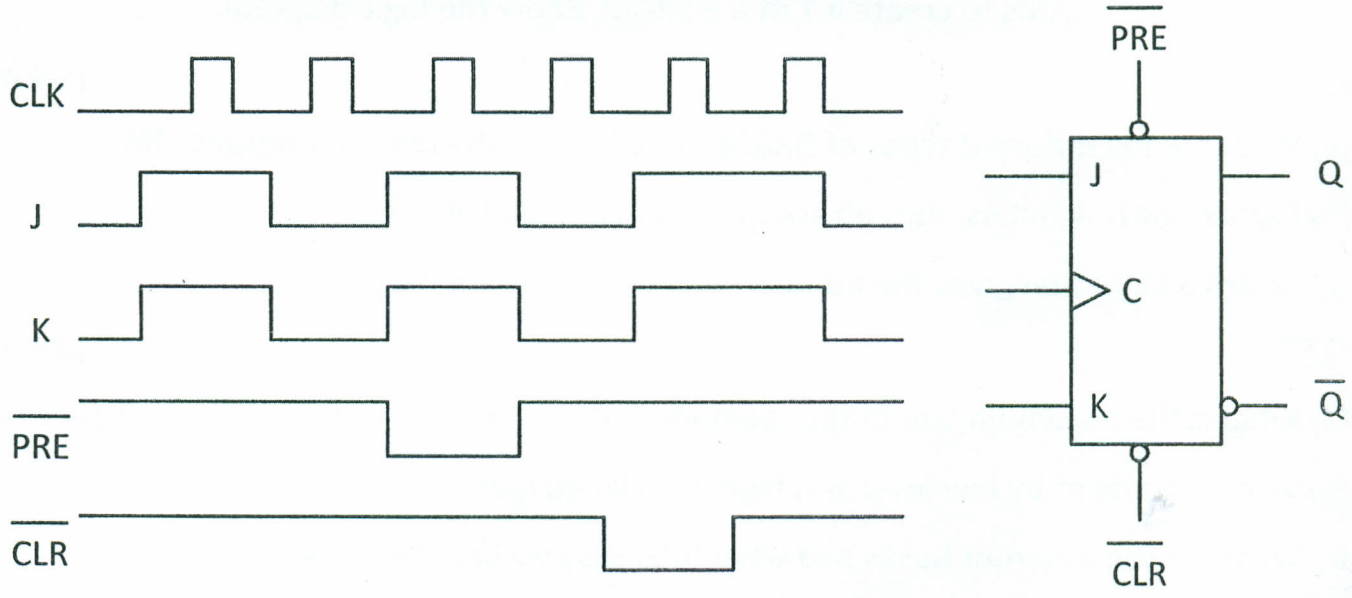
Mansoura University		Electronic Circuits and Microprocessors
Faculty of Engineering		Code: COM2222
Communications Department		Time: 3 hours
2nd Year Electrical		May 2013

Answer the following questions (Max. Marks: 110)

Q.1 **[22 Marks]**

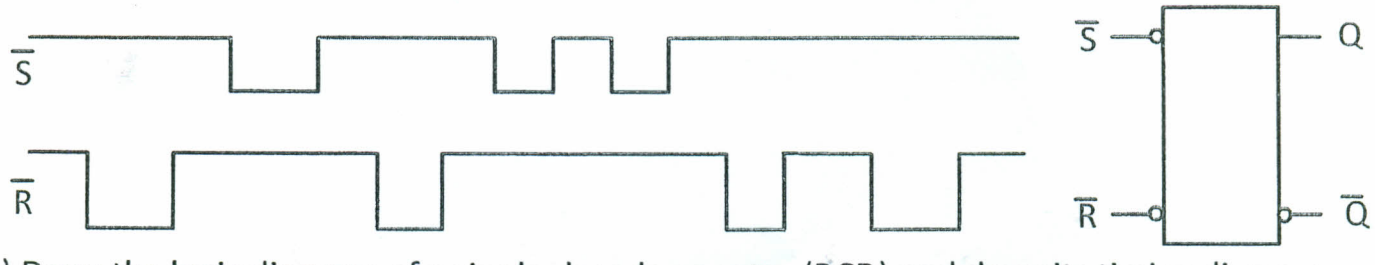
(a) Determine the Q waveform relative to the clock if the signals shown in the figure are applied to the inputs of the J-K flip-flop that is initially set



(b) Draw the logic diagram of a 3-bit synchronous counter and implement the decoding of binary state 2 and binary state 7. Show the entire counter timing diagram and the output waveforms of the decoding gates.

Q.2 **[20 Mar']**

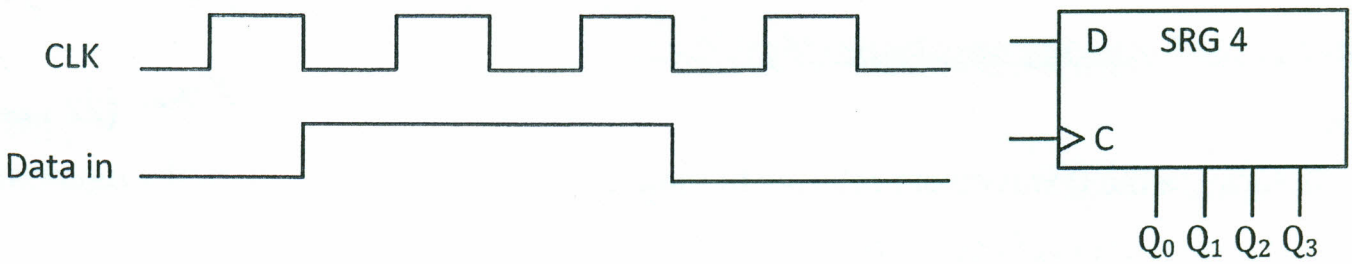
(a) Determine the Q output waveform of the given latch for the inputs shown in the timing diagram. Assume that Q is initially LOW.



(b) Draw the logic diagram of a ripple decade counter (BCD) and draw its timing diagram.

Q.3 **[22 Marks]**

(a) Show the states of the 4-bit register (SRG 4) for the data input and clock waveforms shown in the figure. The register initially contains all 0s.



(b) Use 1 M x 4 SRAMs to create a 1 M X 8 SRAM. Show the logic diagram.

Q.4 **[22 Marks]**

(a) What are the different types of DRAMs. Briefly describe their operations. [6]

(b) Explain, with sketches, the refresh operation in a DRAM. [6]

(c) Design a ROM that gives the number of ones in a 4-bit binary number. [10]

Q.5 **[24 Marks]**

(a) What is the maximum size of the memory that can be accessed by 8086 microprocessor?

(b) What are meant by low level and high level languages?

(c) What are the different buses and what jobs they do in a microprocessor?

(d) What are the differences between memory mapped I/O and I/O mapped I/O?

(e) Describe how the 20-bit physical address is generated in 8086 microprocessor.

(f) Explain the roles of BIU and EU.