



# Daffodil International University

Department of Computer Science & Engineering

Faculty of Science & Information Technology

Final Examination Semester: Fall 2019

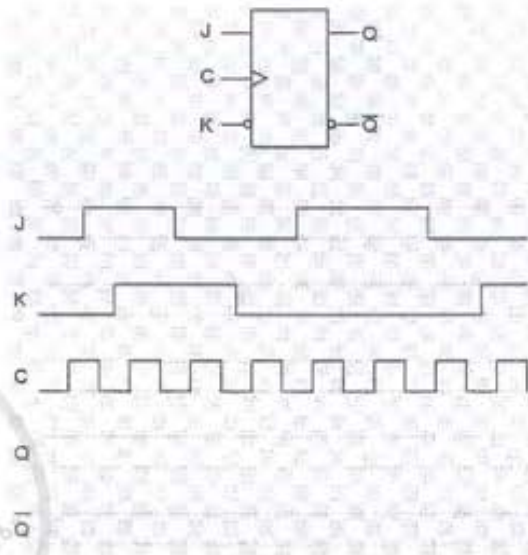
Course Code: CSE 212(Day) Course Title: Digital Electronics

Time: 2.0 hours

Full Marks: 40

*Answer any four(04) from the following questions*

1.
  - a) Suppose you have adders and some normal gates in your lab and your teacher asked you to construct a binary adder and subtractor in one circuit. How would you design it and explain its operation. 5
  - b) Suppose you have J-K flip-flop in your lab and you want to construct a D flip-flop from it. How can you design it? 3
  - c) Write down the differences between NAND and NOR latch. 2
2.
  - a) Construct a 2 to 4 decoder with its truth table and draw a circuit which stores its output in one clock signal. 6
  - b) Implement a full adder circuit using multiplexers. 4
3.
  - a) Construct a 4 to 16 decoder using 3 to 8 decoders and explain how it works? 5
  - b) Differentiate between encoder and priority encoder. Explain the basic operation of priority encoder. 5
4.
  - a) Determine the output states for the J-K flip flop, given the following pulse inputs; consider initial output is zero : 3



b) Find out True/False:

- I. Asynchronous inputs affect the state of the FF independent of the clock.
- II. A MUX is known as data distributor.
- III. An edge-triggered FF changes state always at the beginning.
- IV. Decoders are used in Input/Output selection in computers.
- V. JK flip-flop has an ambiguity.

c) What is the output of an XOR gate when a logic signal and its exact inverse are connected to its inputs?

5. a) Implement the following function with a multiplexer:

$$F(W, X, Y, Z) = \sum(0, 1, 3, 4, 8, 9, 15)$$

b) Simplify the following Boolean function :

$$F(A, B, C, D) = \sum(1, 3, 7, 11, 15) + d \sum(0, 2, 5)$$