

**PRE BOARD EXAMINATION 2019 MARCH**

Bachelor Level/First Year/I Semester Full Marks: 60

Bachelor in Computer Application (BCA) Pass Marks: 24

Digital Logic (CACS105) Time: 3 Hours

Examination Date: 26th, Mar, 2019

*Candidates are required to give their answers in their own words as for as practicable.*

*The figures in the margin indicate full marks.*

**SET A**

**Long Question**

**Attempt any two questions 10x2**

1. What do you mean by asynchronous counter? Design a mod 6 counter using T flip flop
2. What is a full adder? Illustrate it with truth table and implement it with logic gates. Design a 4 bit full adder and subtracter.
3. What is JK master slave flip-flop? Design its logic circuit, truth table and explain the working principle

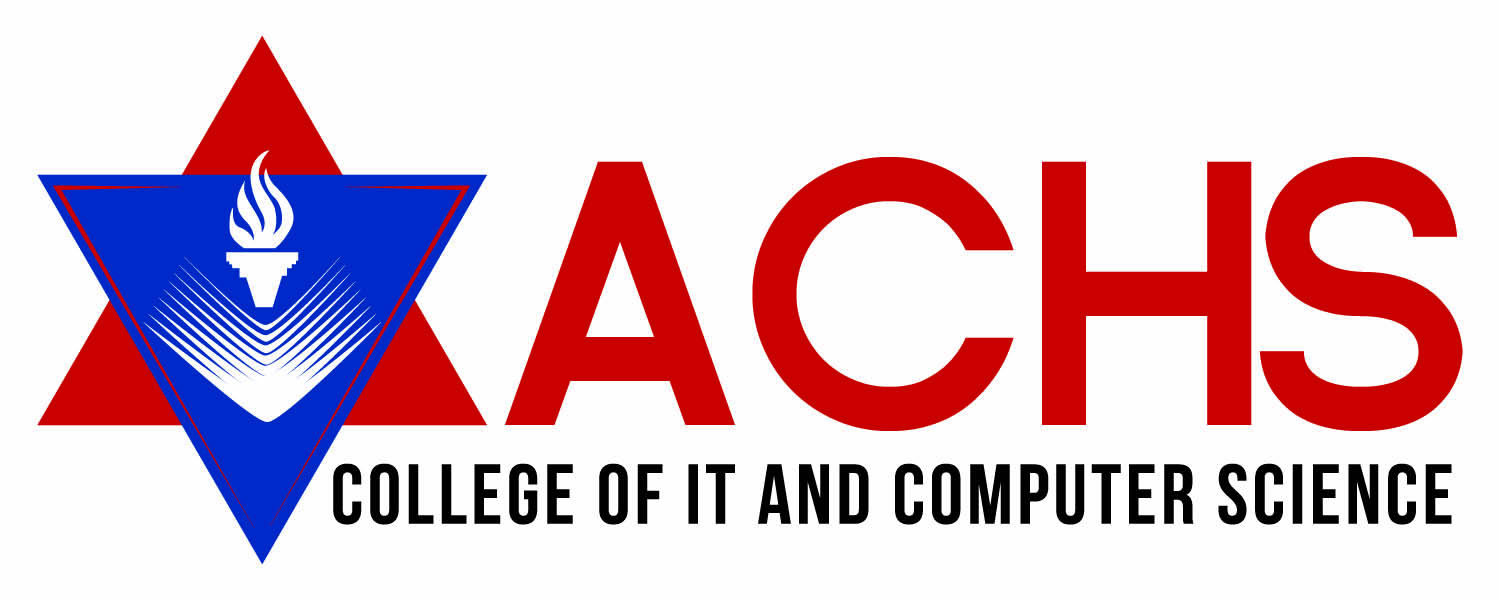
**Short Question**

**Attempt any eight questions**

1. What are digital signals? Explain its advantages over analog signal
2. Convert the following hexadecimal number into decimal and octal number
   1. 0B2F b. 1BCD
3. Design a half adder circuit using NAND gate oinly
4. Explain JK flip flop with its characteristic table and equations.
5. What is a MUX? Design 8X1 mux using lower order mux. Describe how it works
6. Simplify the following Boolean function using K map

w’z + xz + x’y + wx’z

1. What are registers? Explain in brief the various types of registers
2. What is a state table and diagram? Draw the state tabe and diagram of mod-5 counter
3. State and prove De-Morgan’s theorem 1 and 2 with logic gates and truth table.
4. Write short notes on
   1. Triggering a flip flop
   2. excitation table



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**SET B**

**Long Question**

**Attempt any two questions 10x2**

1. What do you mean by synchronous counter? Design a mod 10 synchronous counter using T flip flop
2. What is a decoder? Illustrate a 3x8 decoder with truth table and implement it with logic gates. Design a full adder using decoder.
3. What is JK master slave flip-flop? Design its logic circuit, truth table and explain the working principle

**Short Question**

**Attempt any eight questions**

1. What are digital signals? Explain its advantages over analog signal
2. Convert the following decimal number into binary
   1. 125.20 b. 256.25
3. Design a 2 bit magnitude comparator
4. Convert JK flip flop into T flip flop.
5. What is a DE-MUX? Design 8X1 mux using lower order mux. Describe how it works
6. Simplify the following Boolean function using K map

xw’z + xy'z + x’y + wx’z

1. What are shift registers? Explain how PIPO shift register operate works.
2. What are basic gates? How basic gates are realized using universal gates. Take any one universal gate.
3. State and prove De-Morgan’s theorem 1 and 2 with logic gates and truth table.
4. Write short notes on
   1. BCD codes
   2. RS latch