

SHRI T P BHATIA JUNIOR COLLEGE OF SCIENCE
FIRST SEMESTER EXAM 2023 -2024
ELECTRONICS PAPER II

DATE:- 08/11/23
TIME:- 3 HOURS

CLASS:- XII
MAX MARKS 50

QIA. Select the correct alternative and rewrite the sentences

4 Marks

1. In a combinational logic circuit strobe signal is used for ____
i. Buffering ii. Impedance matching iii. Cascading iv. Resetting
2. A ring counter is _____ type of counter.
i. Synchronous ii. Asynchronous iii. Up iv. Down
3. Hex equivalent of binary number 0.11 is ____
i. 0.3 ii. 0.6 iii. 0.C iv. 0.D
4. _____ is also called a Data Selector.
i. Demultiplexer ii. Multiplexer iii. Encoder iv. Decoder

QI B. Answer any two of the following.

6 Marks

1. Add and subtract 26 and 32 after converting them into Binary. Use ones compliment method for Subtraction
2. Draw the logic diagram of clocked RS flip flop using NAND gates and write its truth table
3. Do the following conversion
 $(F2FA.A)_{16} = (?)_2 = (?)_{10} = (?)_{BCD}$

QII A. Answer any two of the following

6 Marks

1. Draw the logic diagram for the Boolean Equation and write its truth table
 $Y = A.B + B.C + A.B + A.B.C$
2. Explain Ex OR gate with its definition, logic diagram and truth table.
3. With the help of a neat diagram explain the working of J-K flip flop.

QII B. Answer any one of the following

4 Marks

1. Explain the working of a 4-bit binary ripple counter with diagram, waveform and truth table.
2. Write a note on BCD and ASCII code.

QIII A. Answer any two of the following

6 marks

1. What is a Multiplexer? Explain using its block diagram and truth table.
2. What is a logic gate? Explain basic gates.
3. Explain the working of EX-OR gate as a 4 bit parity tester.

QIII B. Answer any one of the following

4 Marks

1. Explain the following terms :
 - i. Clock
 - ii. Edge triggering
 - iii. Racing
 - iv. Toggling
2. What is a Full Adder? Explain its working with truth table and logic diagram.

QIV A. Answer any two of the following

6 Marks

1. Draw a logic diagram of 1:8 Demultiplexer using two 1:4 Multiplexers.
2. With the help of a neat diagram explain working of clocked D- type flip flop.
3. Implement the following Logic expression using Multiplexer.
 $f(A,B,C,D) = \sum m(1,3,5,7,12,14)$

QIV B. Answer any one of the following

4 Marks

1. Explain the working of BCD to Decimal Decoder with logic diagram and truth table.
2. Explain the procedure of combinational logic design using Multiplexer and state its advantages.

QV A. Answer any two of the following

6 Marks

1. Explain the working of right shift register using D flip flop. Draw the necessary waveforms.
2. Write the difference between synchronous and Asynchronous counter.
3. Explain with block diagram four bit binary adder subtractor.

QV B. Answer any one of the following

4 Marks

1. What is a register? Explain the bidirectional shift register with necessary block diagram.
2. Perform the following subtraction 1's complement method of subtraction
 $(11011)_2 - (1011)_2$
 $(11011)_2 - (1011)_2$

OR:

QV A. Answer any two of the following

6 Marks

1. What is a T flip flop? Explain why it is also called divide by flip flop.
2. Explain the working of BCD to 7 segment decoder/Drivers with necessary diagrams.
3. Explain with block diagram, waveform and truth table the working of a decade counter.

QV B. Answer any one of the following

4 Marks

1. State and prove DE Morgan's theorem with logic diagrams.
2. Perform the following subtraction using 2's complement method of subtraction
 $(11011011)_2 - (101011)_2$
 $(11011)_2 - (1101011)_2$