

Time \rightarrow 3 Hours

Full marks \rightarrow 70

Group A
(Compulsory)

1. Answer the following multiple choice questions $2 \times 10 = 20$

i) The base of Hexadecimal number system is

- a) 2 b) 10 c) 8 d) 16

Ans \rightarrow d) 16

ii) An AND gate can have

- a) one input and one output
b) two inputs and two outputs
c) three inputs and two outputs
d) two or more inputs and one output

Ans \rightarrow d) Two or more inputs and one output

iii) A logic gate is an electronic circuit which

- a) makes logic decisions
b) allows electron flow only in one direction
c) works on binary algebra
d) alternates between 0 and 1 values

Ans a) makes logic decisions

iv) An X-OR gate produces an output only when its two inputs are

- a) high b) low c) different d) same

Ans \rightarrow c) different

(v) 2's complement of 11001011 is

- (a) 01010111 (b) 11010100
 (c) 00110101 (d) 11100010

Ans (c) 00110101

(vi) The device used to convert a binary number to a 7 segment display format is

- (a) multiplexer (b) encoder (c) decoder (d) Register

Ans (c) decoder

(vii) Karnaugh map is used to

- (a) prepare layout of a complicated circuit
 (b) construct truth table
 (c) reduce a digital logic circuit
 (d) None of above

Ans → (c) reduce a digital logic circuit

(viii) Asynchronous counters are known as

- (a) Ripple counters (b) multiple clock counters
 (c) decade counter (d) modulus counter

Ans → (a) Ripple counter

(ix) A feature that distinguishes that J-K flip flop from the SR flip-flop is the

- (a) toggle condition (b) preset input
 (c) type of clock (d) clear input

Ans (d) clear input

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⊗ The only function of a NOT gate is to

- (a) stop a signal
- (b) re-complement a signal
- (c) invert an input signal
- (d) act as a universal set

Ans (c) invert an input signal

Group B

Answer any four questions of the following $5 \times 4 = 20$

2. write down some difference between Analog and digital circuits
3. convert 545_{10} to octal form
4. Define minterms and maxterms with example
5. How OR gate can be realized from NAND gate?
6. (a) convert each of the following BCD codes to decimal
(a) 1000 0110 (b) 0011 0101 0001
7. (a) use 2's complement and subtract $11101 - 1101$
(b) use 1's complement and subtract $11101 - 1010$
8. Define multiplexers and de multiplexers
9. write the Boolean expression and Truth Table of X-NOR gate.

Group C

Answer any two questions of the following $15 \times 2 = 30$

10. (a) How can you convert a Binary to hexadecimal number
(b) Hexadecimal to decimal number
(c) Octal to decimal number
Give example in each case
11. (a) What is NOR gate? How NOR gate, OR gate and AND gate can be realized from NOR gate?
(b) How can you construct Full adder from Half Adder. Discuss with Truth Table and Boolean expression
- 12.
13. Describe JK flip flop. What is race around condition in JK flip flop?
14. (a) Explain the working of serial in serial out shift register with logic diagram
(b) Describe 2-bit Asynchronous counter with logic and timing diagram

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