SUB.CODE: 18UPH6C14

REG.NO:

DHANALAKSHMI SRINIVASAN COLLEGE
OF ARTS & SCIENCE FOR WOMEN
(AUTONOMOUS)
(For Candidates admitted from 2018-2019 onwards)

UG DEGREE EXAMINATIONS APRIL – 2021

B.SC – PHYSICS

DIGITAL ELECTRONICS

Time: 3 Hrs **Max.Marks: 75**

PART – A

CHOOSE THE CORRECT ANSWER **(10*1=10)**

1. Which of the following gate is used as Inverter ?
   a) AND b) NOT c) OR d) NAND
2. Convert the binary number (01011.1011)2 into decimal.
   a) (11.6875)10 b) (11.5874)10 c) (10.9876)10 d) (10.7893)10
3. According to boolean law: A + 1 = ?
   a) 1 b) A c) 0 d) A'
4. A Karnaugh map (K-map) is an abstract form of _____ diagram organized as a matrix of squares.
   a) Triangular Diagram b) Cycle Diagram c) Block diagram d) Venn Diagram
5. In a multiplexer the output depends on its _____
   a) Data inputs b) Select inputs c) Select outputs d) Enable pin
6. Half subtractor is used to perform subtraction of _____
   a) 2 bits b) 3 bits c) 4 bits d) 5 bits
7. A basic S-R flip-flop can be constructed by cross-coupling of which basic logic gates?
   a) AND gates b) XOR or XNOR gates
   c) NOR or NAND gates d) AND or NOR gates
8. shift registers are classified into _____categories.
   a) 2 b) 3 c) 4 d) 5
9. Ripple counters are also called _____
   a) SSI counters b) Asynchronous counters
   c) Synchronous counters d) VLSI counters
10. What is the disadvantage of binary weighted type DAC?
    a) Slow switching b) High operating frequency
    c) High power consumption d) Required wide range of resistors

PART - B

ANSWER ALL THE QUESTIONS **(5×7=35)**

11. a) Convert the following decimal numbers into hexadecimal numbers.

    i) 95 ii) 675 iii) Convert $(1001110)_2$ to its octal equivalent.

(OR)

b) State and prove De-Morgan's theorems.

12. a) Solve using the Boolean identities.

    i) $ABC + A\bar{B}C + AB\bar{C}$

    ii) $A + \bar{A}B$

(OR)

b) Discuss the essentials of SOP and POS forms.

13. a) Explain the action of 4:1 Multiplexer using basic gates

(OR)

b) Discuss the role of Encoder.

14. a) Explain the operation of clocked **RS** flip-flop with it's truth table.

(OR)

b) What is a shift register? Explain the operation of a 4-bit shift register.

15. a) Explain why synchronous counters are more advantageous than asynchronous counters ?

(OR)

b) Discuss the A/D conversion by Successive approximation method.

PART - C

ANSWER ANY THREE QUESTIONS **(3 ×10=30)**

16. Explain the universality of NAND and NOR gates.

17. Simplify the following functions using K-map technique.

    a) $Y = \bar{A}BC + A\bar{B}C + AB\bar{C} + ABC$

    b) $Y = \bar{B} + ABC$

18. Explain the action of Half adder and Full adder.

19. Draw and explain the action of Master- slave JK flip flop and how JK flip flop can be converted into a D- flip flop?

20. With neat diagram discuss the principle operation of R-2R binary ladder method.