

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034



B.Sc. DEGREE EXAMINATION – PHYSICS

FIRST SEMESTER – NOVEMBER 2019

UPH 1502 – INTRODUCTION TO DIGITAL ELECTRONICS

Date: 01-11-2019

Dept. No.

Max. : 100 Marks

Time: 09:00-12:00

PART A

Answer all questions:

(10 X 2 = 20)

- 1) Give the symbol and truth table of OR gate.
- 2) Draw AND gate using NOR gates.
- 3) Explain sum of products (SOP)
- 4) State de Morgan's theorem.
- 5) What is meant by binary number system?
- 6) Convert binary numbers $(101011)_2$ to octal numbers.
- 7) Draw half adder circuit and give its truth table.
- 8) Add 13 and 7 using binary addition.
- 9) What is a flip-flop?
- 10) Draw the T flip-flop and give its truth table.

PART B

Answer any FOUR questions:

(4 X 7.5 = 30)

- 11) Explain positive and negative logic.
- 12) Explain 4-variable K map with a suitable example.
- 13) Convert the following hexadecimal numbers to decimal a) $(E9)_H$ b) $(FFFF)_H$ c) $(604)_H$
- 14) How is 2's complement representation used to perform subtraction?
- 15) Discuss the function of D flip-flop with suitable diagram.
- 16) Construct AND and OR gates using NAND gates.

PART C

Answer any FOUR questions:

(4 X 12.5 = 50)

- 17) Explain how NOR gate is used as AND, OR and NOT gate.
- 18) Simplify using K map $X = F(A,B,C,D) = (0,1,3,5,7,9,11,12,13,14,15)$
- 19) What is gray code? Represent $(45)_{10}$ in binary and gray code.
- 20) Explain the working of a full adder with truth table.
- 21) Explain the operation of RS flip-flops
- 22) Simplify the Boolean function $F(A,B,C)$ in sum of products using don't care condition, d
 $F = \overline{B} + \overline{A}C$
 $d = BC + AB$
